

The Health and Welfare of Territorians

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Preface

As a key service to the Northern Territory community, as part of its accountability to the community, and to keep the health sector informed, Territory Health Services distributes regular reports on a range of aspects of health in the NT, provides information to national data collections, produces reviews on topics of special interest, and publishes an Annual Report on its services and performance.

This publication is the first to present a broader picture of health issues. It brings together different kinds of information over time - health determinants, health outcomes, and health services - within a single publication, and includes comment as well as statistical data and factual information.

THS has a comprehensive definition of Health as Social, Mental, and Physical Wellbeing and incorporates a range of community services into a single department with responsibility for health, families, and children. Further, health is not only the outcome of a complex web of interacting determinants, risk and protective factors, but also a resource for every other facet of living. It therefore involves and impacts on, a diverse range of sectors and interests.

For this reason, while most of the information has been gathered and presented by groups of THS specialists collaborating across the spectrum of care, there has also been substantial input by other NT government departments and by community agencies. Some papers are explicitly co-authored by THS and another agency, and two were specifically commissioned from organisations outside the Department. 'Determinants of Health', prepared for the Cooperative Research Centre for Aboriginal and Tropical Health, presents a perspective on health inequalities, particularly emerging epidemiological and biomedical evidence relating to the relationship between the degree of 'sense of control' experienced by people and the development of a range of chronic health problems. 'Aboriginal Health', prepared for the Aboriginal Medical Services Alliance of the Northern Territory, presents a perspective on the history of the health of Aboriginal people today, and the genesis and role of the community controlled health services movement. Both reaffirm the complexity of health and its determinants as well as the vital role of quality comprehensive primary health care. Underlying factors and direct causative factors impacting on Aboriginal health are also summarised in 'A Model for Understanding Aboriginal Health' from the NT Government's *Aboriginal Health Policy 1996*, which is reproduced in the 'Introduction'.

This publication, like any examination of health issues in the Northern Territory, is powerfully influenced by our unique demography – most especially factors of distance and remoteness, and that 28% of our population are Aboriginal people. While the health status of the majority of Territorians compares very favourably with that of other Australians, it is well documented that Aboriginal citizens across the nation have not shared equally in the improved health outcomes accomplished for most of us.

As well as these disparities, which are particularly prominent in the NT setting, it is important to draw attention to improvements:

- a substantial fall in death rate of NT Aboriginal children and young people over the past two decades
- increasing birth weights of NT Aboriginal infants over the past decade
- a major decline in hospitalisation of NT Aboriginal children for gastroenteritis
- lower incidence of melanoma and cancers of the breast, prostate and bowel than Australian rates.

A further characteristic of the Northern Territory is our close proximity to our Asia Pacific neighbours. The timing of this publication has not been able to capture the emerging impacts of recent socio-political changes in the region on communicable and vector-borne disease surveillance and control services. These are being documented in the THS Annual Report, Communicable Disease Bulletins, and prepared presentations.

This publication is the collective product of the work of many agencies, and numerous staff across THS. It is distinguished from other THS publications by bringing together information, ideas and views from a diversity of sources and sectors to stimulate further discussion and action among those who have an interest in the present and future Health and Welfare of Territorians.

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Introduction

by John Condon

Compared with other Australians, the people of the Northern Territory are younger and in many respects healthier and more active. The tropical climate of the Top End and the desert climate of Central Australia encourage an easy-going outdoors lifestyle for most of the year. The NT is developing rapidly in all areas, including population, infrastructure, economy, social institutions and community activity. The population is growing at approximately twice the rate of Australia overall. The climate, the diverse population, and the lack of long-established institutions promote an informal way of life that is highly valued by most Territorians, and envied by many visitors.

The NT covers approximately one sixth of the land mass of Australia, but includes only one percent of the Australian population. There are only five urban centres, all of which are remote from the rest of Australia, and only two of which have populations of greater than 10,000 people. Thirty percent of the NT population lives outside these five centres.

The NT population is in several ways different to that of the rest of Australia. Aboriginal people comprise 28% of the population, a much higher proportion than any other part of Australia (ABS 1998a). Seventy percent of Aboriginal people live in remote communities, compared to only 35% of non-Aboriginal people (throughout this publication 'Aboriginal' includes Torres Strait Islanders).

The age structure is very different from that of the rest of Australia. The NT population is younger than the total Australian population, with only 3% being aged over 65 years, compared to 12% of the total Australian population. The Aboriginal population is particularly young, with 38% being aged under 15 years, compared to 22% of the NT non-Aboriginal population and 21% of the Australian population overall (ABS 1998b).

Both the Aboriginal and non-Aboriginal populations in the NT are young populations, but for different reasons. Aboriginal people in the NT have very high

fertility and mortality rates, and much lower life expectancy than non-Aboriginal people. Their age distribution is illustrated in the population pyramid (graph 1.2) which has a very wide base but rapidly tapers off to a very small proportion of people in the older age-groups.

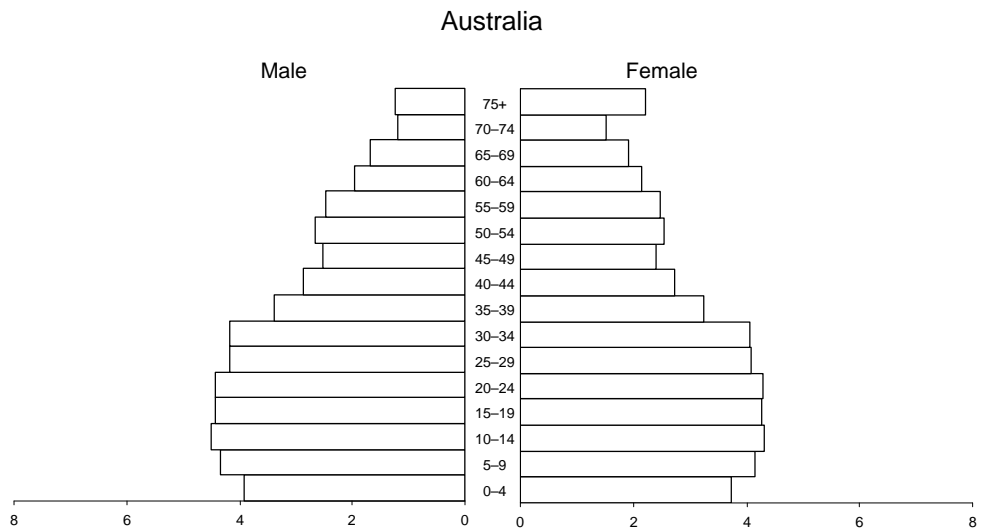
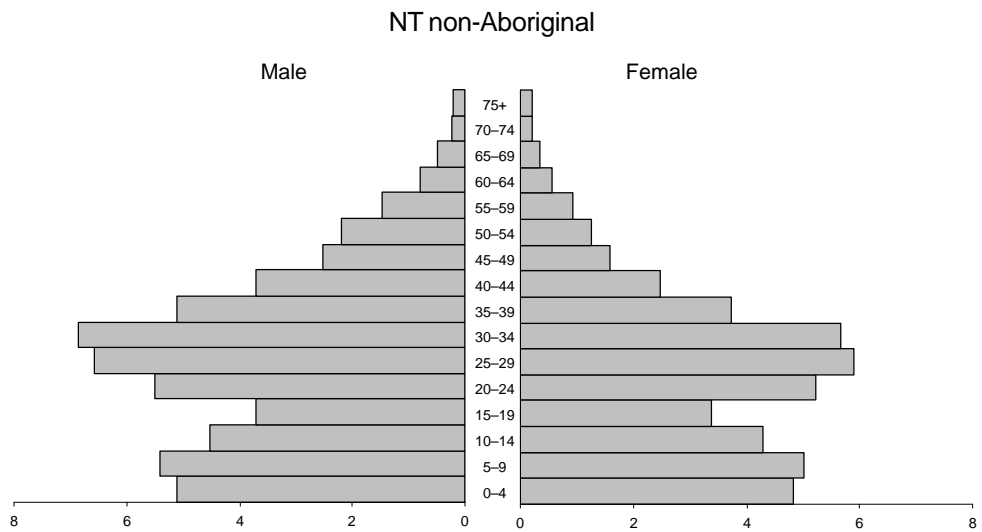
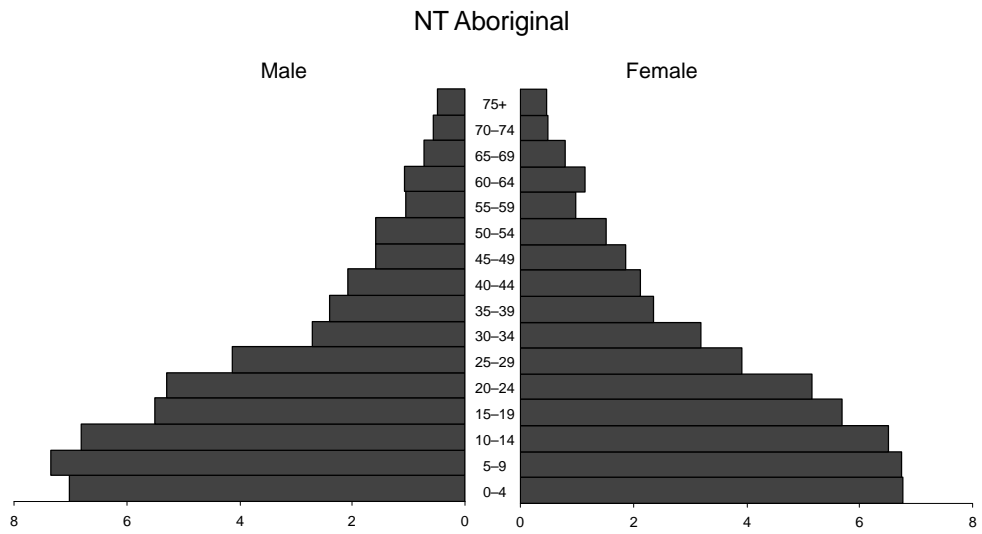
Aboriginal people in the NT comprise a very stable population as they do not frequently move their place of residence between the NT and other states. The non-Aboriginal population of the NT includes both a stable core group and a highly mobile group, with a high proportion of the population having moved here from interstate, and a high turnover of people each year as people move into and out of the NT. The large increase in the military population in the past ten years is a good example of a highly mobile group who are resident in the NT for a period of years as 'migrant workers'. A migrant worker population is characterised by a population of younger adults with young children (graph 1.2).

While the mobility of the non-Aboriginal population has decreased over recent years, particularly in comparison to the years after cyclone Tracey in 1974, there is still a high level of interstate migration. In the 1996 census, 33% of non-Aboriginal NT residents reported that they were not living in the NT five years previously, compared to only 5% of Aboriginal residents (1996 Census special data analysis, unpublished).

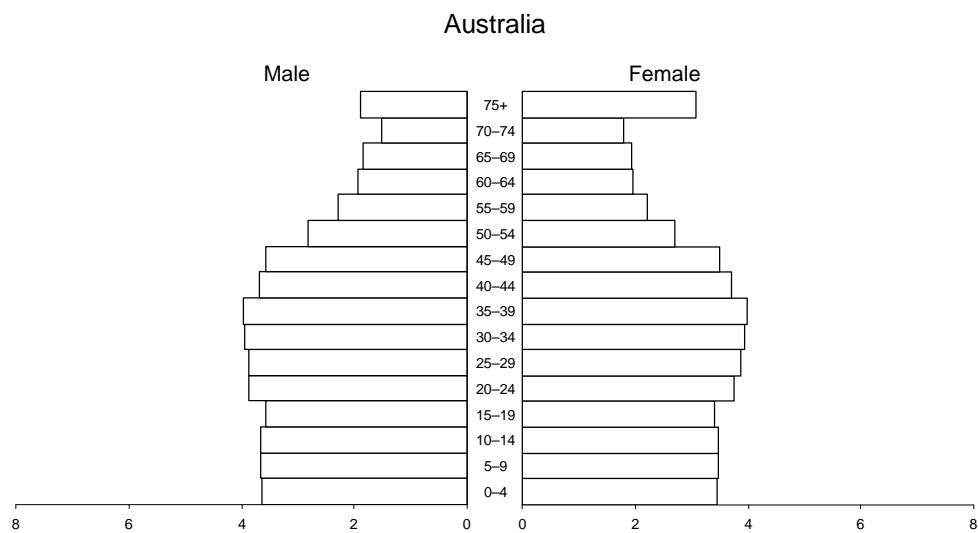
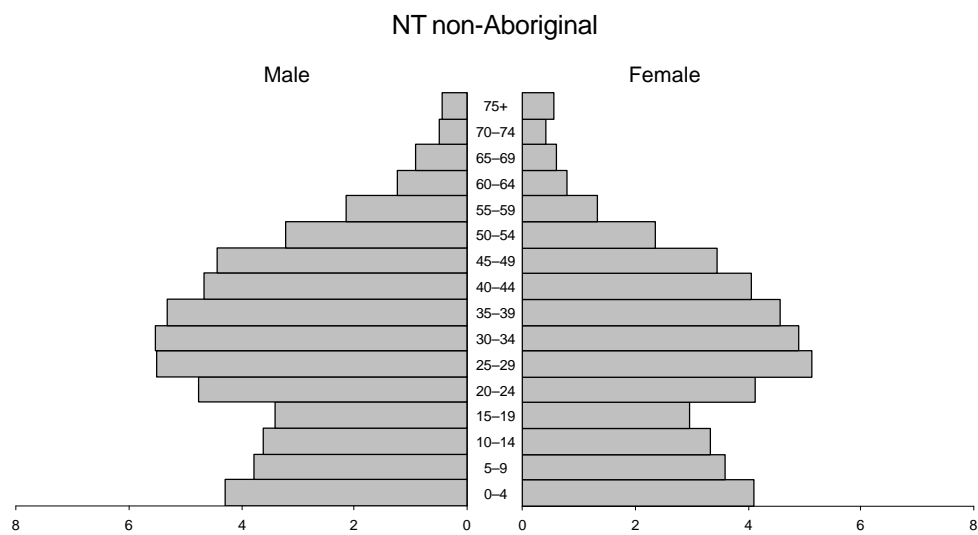
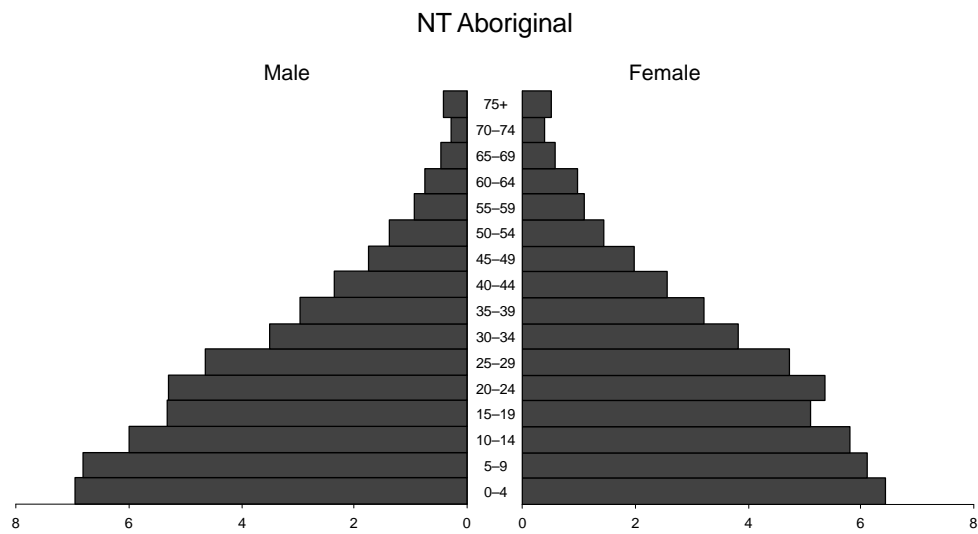
Overall, the health status of non-Aboriginal Territorians appears to be similar to that of other Australians. NT non-Aboriginal females may in fact be somewhat healthier than Australians overall. Death rates are a good measure of the overall health status of populations. Non-Aboriginal male death rates are slightly lower than Australian rates, while non-Aboriginal female death rates are considerably lower than Australian rates.

This may be because a large proportion of the NT non-Aboriginal population has moved to the NT from other states for employment reasons. People with

1.1 1981 population pyramids



1.2 1996 population pyramids



A model for understanding Aboriginal health

A model for understanding the relationship between ill-health, direct causative factors and underlying factors.

FACTORS CONTRIBUTING TO ABORIGINAL ILL HEALTH

Underlying factors	Direct causative factors	Ill health
<p><i>Political, Cultural & Identity</i> History of European/Aboriginal contact</p> <p>Loss of: Own culture, lands & identity, law, family links Power over and responsibility for their own lives Meaningful activities</p>	<p><i>Lifestyle</i> Food & nutrition Smoking Alcohol abuse/misuse High levels of mental stress</p>	<p>Obesity, diabetes, hypertension, heart disease, low birthweight, increased damage caused by infections Increased risk of infections, lung damage, respiratory disease, heart disease, cancer, low birthweight Violence, accidents, social disruption, hypertension, liver damage, brain damage, STDs</p>
<p><i>Demography & Geography</i> Small, dispersed, remote, multi-lingual, multi-tribal communities High cost & difficulties in providing services in remote communities</p>	<p><i>Environmental health</i> Overcrowded housing Inadequate standard of housing Inadequate sewerage Inadequate water supply Poor hygiene</p>	<p>Diarrhoea Trachoma & eye disease Respiratory diseases & infections Renal disease, skin sores & infections</p>
<p><i>Education, employment & economic</i> Lack of relevant and culturally appropriate education Lack of meaningful occupation/employment Lack of relevant health knowledge</p>	<p><i>Health services</i> Late presentation/diagnosis/treatment Under-utilisation of health services</p>	<p>High hospitalisation rates More severe illness More chronic illness</p>

Source: Reproduced from NT Aboriginal Health Policy 1996

serious disabilities or chronic illnesses are less likely to move interstate, away from family and support services, than those without such impediments. This phenomenon is very apparent in mining towns such as Nhulunbuy and Alyangula—the non-Aboriginal male death rate of the East Arnhem District is much lower than the Australian male rate, and the non-Aboriginal female death rate is almost nil (Dempsey and Condon 1999).

However, there are some causes of death which are far more common in non-Aboriginal Territorians— injury being the most notable. Harmful behaviours are also more common, with excessive rates of both alcohol consumption and smoking in non-Aboriginal Territorians compared with other Australians.

While non-Aboriginal Territorians are in most respects at least as healthy as other Australians, most (but not all) Aboriginal people in the NT and throughout Australia have much worse social and economic circumstances, and worse living conditions and health status than other Australians. NT Aboriginal death rates are over three times higher than Australian rates, and life expectancy is approximately 20 years less than that of other Australians (Dempsey and Condon 1999).

The severe disadvantages suffered by Aboriginal people in many aspects of their lives and their resultant serious health problems are recurring themes throughout this publication.

Content of this publication

This comprehensive publication follows a series which reported on health status in the NT: *Health Indicators in the Northern Territory* published in 1986 (Devanesen and others) and *Northern Territory Health Outcomes, Morbidity and Mortality, 1979–91* published in 1995 (Plant and others).

These previous publications were detailed statistical reports, consisting principally of mortality and hospital morbidity statistics. The style of this publication is a more narrative summary of health information rather than the detailed statistical presentation of its predecessors. This publication is heavily influenced by the national series *Australia's Health* and *Australia's Welfare*, produced every two years by the Australian Institute of Health and Welfare, which provide useful comparisons for the information presented here.

This publication also covers a much greater range of topics than its predecessors, summarising the best available information on the current health status of the people of the Northern Territory, many of the important determinants of their health status, and the health services available to them. There is great variation between chapters. While some chapters, such as Injury and violence, contain primarily statistical data, others, such as the chapter on underlying causes of health and disease, present a broader overview, including historical and social perspectives. The more narrative and analytical chapters are particularly valuable in exploring the basis of Aboriginal ill-health and appropriate approaches to the issues of Aboriginal health. These chapters link the statistical and other factual information presented, and draw disparate elements together in order to explain and explore Aboriginal health in a variety of contexts.

There are five sections covering:

Determinants of health

Chapters two to five discuss some of the important determinants of health status: underlying causes of health and disease, environmental health, food and nutrition and substance misuse.

Specific health issues

Chapters six to eleven discuss particular health issues or diseases: mental health, dental health, communicable disease, injury and violence, chronic disease and cancer.

The health of particular groups

Chapters twelve to fourteen discuss the health of particular population groups: children, women and Aboriginal people.

Health services

Chapters fifteen to nineteen cover community health, hospital, aged care and disability services, including the health workforce.

Death statistics

The final chapter looks particularly at deaths and causes of death. Mortality statistics are the oldest and most complete statistical measure of health status. While mortality statistics present only a superficial and incomplete picture of health issues, they are

nevertheless a basic and still very informative indicator of health trends over time and differences in health status between populations.

Much of the information presented is based on more detailed information published in specialised reports. Readers interested in particular areas will want to read further in specific publications—each chapter concludes with a list of references and further reading. Details of statistical methods used in this report are contained in the Appendix.

The information contained herein is a broad summary, and so cannot provide detailed information on all areas. Lack of reliable data on some issues means that they do not feature prominently in a publication such as this, although they may be very important to our health and well being.

Health information

The NT has limited sources of health information compared to other parts of Australia, particularly on the determinants of health status. National population surveys, which ask a sample of the Australian population directly about health, behaviour and social circumstances, are an important source of information. Recent surveys include the National Health Survey, National Survey of Disability, Aging and Carers, National Mental Health Survey, and the National Nutrition Survey. Unfortunately these surveys usually include only a small number of NT residents. The NT has only one percent of the Australian population so most national surveys select only one percent of their sample in the NT, usually only a few hundred people. This is not enough to provide reliable data specifically on the NT.

Much of the information presented in this publication uses administrative data from information systems used in the delivery of health services. This may be either a by-product of managing health services (such as the Hospital Morbidity Dataset and the Community Care Information System), or data collection systems for particular diseases (such as the Rheumatic Heart Disease Register). Data sources in areas such as births and deaths, hospitalisation, child welfare, immunisations, infectious diseases, cancer, maternal and child health, and alcohol and other drugs are well established and reliable, although improvements are still required.

Administrative systems are very useful in providing information about illness and disease, but do not provide information about people's risk factors, such

as poor diet, smoking or alcohol consumption, nor about the physical and social environment in which they live. People access the health care system when they have particular health problems, rather than seeking advice on how to avoid or prevent such problems. Surveys and specific research projects are conducted in the NT on some of these issues, but local surveys cannot completely compensate for the lack of reliable NT data from national sources.

Throughout this publication statistics are presented separately for Aboriginal and non-Aboriginal people. Health indicators for the total NT population give a somewhat misleading impression of health status. NT Aboriginal health statistics are frequently (but not always) worse than Australian figures, while NT non-Aboriginal statistics are usually similar to Australian figures. However, because Aboriginal people comprise almost 30% of the NT population, health statistics for the total NT population are worse than Australian figures for most health issues. This hides the fact that 70% of people in the NT are very similar to the rest of the country, while 30% are very different.

Infant mortality is a good example of this. In the late 1990s the Australian infant mortality rate was approximately 5 infant deaths per 1,000 live births, while the NT rate was over twice as high at approximately 13 deaths per 1,000 live births. This would seem to indicate to parents in the NT that their newborn babies face over twice the risk of death in their first year of life than other Australian babies.

However this information is misleading, over-estimating the risk for most parents but under-estimating it for Aboriginal parents. The NT non-Aboriginal infant mortality rate during this period was approximately 6 deaths/1,000 live births, only slightly greater than the Australian rate, but the Aboriginal rate was almost 20 deaths/1,000 live births, more than three times higher than the Australian rate. Approximately one-third of babies born in the NT each year are Aboriginal, and these babies face a much higher risk of death in their first year of life—approximately 2% will not survive. The other two-thirds of newborn babies face much the same risk of death as newborn babies throughout the rest of the country—99.4% will survive their first year.

The overall NT infant mortality rate does not inform us about the true risks faced by newborn babies. The overall rate indicates that all babies in the NT face twice the risk of death of babies elsewhere in Australia, whereas this risk is no greater for most, but tragically three or four times higher for some.

It is thus important to have specific health information on Aboriginal people because of their very different health status. The identification of 'indigenous status' in health records is essential to provide this specific information. If it is not known whether individuals are Aboriginal or non-Aboriginal, health statistics cannot be calculated for each group.

The identification of Aboriginal and Torres Strait Islander people in many health data sources in the NT is thought to be close to complete. Formal auditing of the accuracy of indigenous identification has been undertaken for some data sources. Indigenous identification in the NT Hospital Morbidity Dataset (from which hospital statistics are derived) was audited in late 1997 and found to be approximately 95% accurate (see Hospital services chapter) (Condon 1998). The Australian Bureau of Statistics estimates that indigenous identification in NT birth and death registrations is more than 90% complete.

Most issues covered in this publication include specific information on both Aboriginal and non-Aboriginal Territorians. The publication provides a comprehensive and reliable picture of health and welfare issues in the NT, and is a very useful resource not only for health professionals but for all Territorians.

References

- ABS 1998a, *Census of population and housing: Aboriginal and Torres Strait Islander people, Australia*, cat no 2034.0, Canberra.
- ABS 1998b, *Northern Territory in focus 1998*, cat no 1306.7, Canberra.
- ABS 1998c, *Demography Northern Territory 1997*, cat no 3311.7, Canberra.
- ABS 1998d, *Experimental projections of the Aboriginal and Torres Strait Islander population*, cat no 3231.0, Canberra.
- Condon JR, Williams DJ, Pearce MC, Moss E, 1998, *Northern Territory hospital morbidity dataset: validation of demographic data 1997*, Territory Health Services, Darwin.
- Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory, 1979 to 1997*, THS, Darwin.
- Devanesen D, and others 1986, *Health Indicators in the Northern Territory*, Northern Territory Department of Health, Darwin.
- Plant A, Condon JR, Durling G, 1995, *Northern Territory Health Outcomes, Morbidity and Mortality, 1979-91*, Territory Health Services, Darwin.
- THS 1996, *NT Aboriginal Health Policy 1996*, Darwin.

Determinants of health

Underlying causes

by Jeannie Devitt, Gillian Hall and Komla Tsey (for the Cooperative Research Centre for Aboriginal and Tropical Health)

What is health?

There is widespread and general acceptance that 'health' is more than not having a disease and that an holistic approach should guide efforts to improve health. Nevertheless, it is difficult to define health. NT policy documents (THS 1996a; THS 1996b) propose two of the more frequently cited definitions—that of the World Health Organization (WHO) in the Declaration of Alma-Ata:

...health ... is a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity.

and an extension of that definition proposed by the National Aboriginal Health Strategy (NAHS) Working Party in 1989 (NAHS 1989):

Not just the physical wellbeing of the individual but the social, emotional and cultural wellbeing of the whole community. This is the whole-of-life view and it also includes the cyclical concept of life–death–life.

The WHO definition emphasises an holistic, multifaceted view of health. The Alma-Ata Declaration also notes that achieving health in this broad sense is beyond the health sector alone. The NAHS definition also emphasises an holistic approach: it proposes wellbeing as an attribute of communities, as well as of the individuals within a community; and it identifies cultural wellbeing, along with social and emotional wellbeing, as equally central to health.

Because 'health' is so difficult to define, we advance our understanding by investigating those situations where it is obviously absent; indeed it is 'non-health' or ill health that provides the starting point of most health-related research. Our goal is to understand better the determinants or underlying causes of health. The way we explain or try to make sense of the reasons why some people are healthy and others are not, and our attitudes towards such explanations, determine to a large extent the actions that we take, both as individuals and as a society, to promote health. Only when our analysis of the underlying causes is accurate and meaningful is it likely that our actions to promote health will succeed.

NT health differences

It is immediately evident from the data presented in this publication that Territorians are not equally healthy. Differences, for example, between the health of NT men and NT women are reflected in their different life expectancies, as well as their death rates for the main causes of death (see Causes of death chapter). There are differences too, between the NT as a whole and Australia generally—for example, the proportion of NT deaths caused by injury, which includes motor vehicle accidents and suicides, is well above that of the nation as a whole (approximately 20% compared with 6%) (ABS 1997b). However, by far the most consistent differences are within the NT population, between Aboriginal and non-Aboriginal Territorians.

Aboriginal people in the NT, as elsewhere in Australia, carry a dramatically disproportionate burden of poor health across virtually all of the measures presented in this publication. The most graphic summary statement of this is perhaps that (ABS 1997b):

- Aboriginal Australians born in the 1990s have a life expectancy that is almost 20 years lower than other Australians
- 58% of NT Aboriginal deaths occur before the age of 55 compared with 17% of deaths among non-Aboriginal Territorians
- for all major causes of death among both men and women of the NT, Aboriginal death rates far exceed those of non-Aboriginal Territorians

There have been some improvements—in Aboriginal infant mortality rates, for example—but the question remains: why does this profile of deplorable health persist in one small population encapsulated within an affluent, technologically sophisticated nation such as Australia? Is it a lack of health services reaching Aboriginal people? Is it related to poverty, poor living conditions and the multiple legacies of dispossession and colonisation? Is it lack of knowledge among Aboriginal people about how to be healthy, or is it the consequence of adopting high risk behaviours like smoking, substance abuse and eating poorly? Does it perhaps arise from different genetic endowments?

It has long been known that all these factors, in some way, contribute to poor health outcomes (see, for example, Anderson 1988; Reid & Trompf 1991; Siggers & Gray 1991, Hunter 1993; Mathews 1997; Bartlett 1998). The precise mechanisms of *how* they do have been less clear. In this chapter, we reconsider the unequal distribution of health and wellbeing among Territorians in the light of recent research that examines the pathways through which our social and physical environment, as well as our genetic endowment, interact, resulting in better health for some people and greater amounts of illness and early death for others. We then relate that understanding to the situation in the NT.

Health determinants: 'new' views from research

Low socioeconomic status is everywhere the most important risk factor for health (Evans & others 1994; Marmot, Ryff & others 1997). This finding in itself is nothing new. It has long been clear that poverty is powerfully predictive of poor health. People of low socioeconomic status have higher levels of ill health because, generally speaking, they lack the finance, knowledge and skills to acquire the essential prerequisites of good health—such as suitable housing, education, nutritional diets and so on. They are thus unable to achieve a healthy lifestyle in a safe environment.

The Whitehall studies

Research has now demonstrated that, in a situation where poverty is not a factor, health still remains unequally distributed throughout the group. This is shown in the long-term, ongoing studies (referred to as 'the Whitehall studies') that the International Centre for Health and Society at the University of London conducted with a large group of British civil servants (Marmot, Bosma & others 1997). This research suggests that social inequality in itself, independently of poverty, affects health. The health inequalities documented in the study group showed a clear and consistent correlation with the rank of the individual within the service, and this was so across all health indicators measured.

The social gradient of disease

The Whitehall studies demonstrated the existence of a clear 'social gradient of disease' such that 'the

lower you are in the hierarchy, the higher the risk of disease' (*Mastering the Control Factor* 16 Nov 1998). Of the four identified levels or ranks in the civil service, those in the middle levels had more disease than those in the top rank; those in the bottom rank had the highest levels of disease (Evans & others 1994).

While risk factors such as smoking and so on also clustered unequally (but systematically) throughout the study group, such factors accounted for only ...*between a quarter and a third of the social gradient. In other words, for people who have equivalent levels of smoking, blood pressure and plasma cholesterol, we still find that where you are in the hierarchy is powerfully related to your disease risk. So there has to be something else going on.*

That 'something else' relates to psychosocial factors; the amount of control people have over their lives, including whether they are part of an integrated social network and whether they have access to supportive relationships. In particular, it is the level of control an individual has within their environment that determines whether the demands and stresses they experience have neutral, positive or negative consequences in terms of health (*Mastering the Control Factor* 9 Nov 1998).

Individual control as a health determinant

In a situation where individual workers experience high levels of demand but have a low level of control to cope with those demands, the health outcome is negative. On the other hand, where an individual has greater control of the factors impinging on their situation, they are able to better manage demands and consequently experience, it seems, less harmful health outcomes.

Thus, in the Whitehall studies, those at the top of the service—despite bearing heavy work-related demands and responsibilities that lead to considerable stress—did not manifest the negative health consequences experienced by their less empowered colleagues in the ranks below them.

Linking chronic stress and disease

In the absence of poverty, how does a low level of control translate into disease and illness for individuals? Here, too, research into the effects of stress is elucidating the intricate and delicate connections between the mind and the body. A range of evidence—new and contentious but

accumulating—explores how the nervous, endocrine and immune systems may interact under various kinds of stress to effect both short and long-term physiological consequences. This work suggests that certain cascades of consequences may be initiated by psychosocial and/or biological stress (*Mastering the Control Factor* 16 Nov 1998).

There seem to be links in a causal chain that connects low levels of control and/or other kinds of psychosocial stress to neuroendocrine responses that have defined physiological outcomes including, ultimately, the precursors to certain diseases (McEwen 1998). Chronic stress of the damaging kind arises in situations where an individual experiences a great deal of demand at the same time as having a low level of control over the factors impinging on them; it arises when individuals are in a situation of continual anxiety, heightened vigilance and worry; it accompanies situations of chronic boredom (McEwen 1998).

Research in this field suggests that, although the body's stress mediators—the hormones that the body produces in rapid response to various kinds of stress—are essential for maintaining health, they can also be damaging if the body produces an oversupply (McEwen 1998). Situations of sustained or chronic stress are known to alter the patterns of production of these mediating hormones, thereby transforming their potential benefits to potential harm. McEwen refers to the cumulative effect of such stress as 'allostatic load' and says: '... the things which really affect most people's health over long periods of time are not dramatic life events, but are really the day-to-day problems, the wear and tear that we all experience in one degree or another, and ... these effects may accumulate over months and years to cause problems' (*Mastering the Control Factor* 23 Nov 1998). There is likely to be a long lead time between damage-causing situations and the final manifestation of 'disease' (of whatever form) in particular individuals.

Cultural change and stress

This body of research also considers how cultural change is associated with stress (Evans & others 1994). Whether through historical time at the same geographical location or through migration, the process of culture (and related social) change exposes the taken-for-granted values of existing community life to scrutiny and challenge. Cultural change powerfully affects the structure of social relationships; in particular, it redefines the things that mark or indicate social standing—the symbols of prestige—as well as reshaping the relations of access to both prestige and status.

Where cultural change results in social stratification, the upwardly mobile cope well with the changing milieu for as long as they maintain their generally upward trajectory. On the other hand, those individuals who fail to achieve social standing or recognition, because they are unable to gain access to the symbols of the new social and cultural regime, experience the rapid and widespread change as a source of stress. In other situations, cultural change does not lead to significant social stratification, but nonetheless introduces the material culture of modernity along with alternative social values. To the extent that those values and/or goods confront or contradict the values underpinning the existing community ethos, they will generate tensions and stress.

Evans and others (1994) suggest that it is not cultural change in itself that affects health but rather the extent of the change, including the impact of change on traditional ways of coping with stress. When social and cultural change occurs at such a rate that it exceeds people's ability to cope with or accommodate it, they experience a decreasing capacity to control the circumstances of their lives.

The social gradient of health

The demonstration of a social gradient of health predicts that reducing inequality itself has health benefits for all, not simply for the impoverished or deprived minorities within populations. There are renewed calls for reinvigorated attention, including research attention, towards constructive ways of altering the social environment (Evans & others 1994).

Rather than more health-specific information, advocates call for sustained interventions that primarily provide the kinds of skills which enable people to operate more effectively within their existing environment—that is, skills that give individuals and/or groups an increased level of control over their circumstances. They point, for example, to the successes of the Headstart program provided to a group of poor, African-American children. A study, which followed this group through the course of their lives to age 28, demonstrated that the individuals receiving such an intervention were subsequently distinguishable from their contemporaries by increased rates of graduation and decreased levels of welfare, early pregnancies and crime (Evans & others 1994; *Mastering the Control Factor* 9 Nov 1998).

Another landmark study involved the bus drivers of San Francisco, whose cardiovascular health improved when they were given more control over their working

environment. Significantly, previous attempts by employers to use risk factor control strategies had been unsuccessful (*Mastering the Control Factor*, November 1998).

In Australia in the 1970s, a pre-school program based on strengthening specific language skills in children in the Bourke region was introduced by Nurcombe and others (Nurcombe 1973). They demonstrated sustained improvements in primary school performance in the participants.

The key factor is something Professor Len Syme calls ‘mastery’: being able to traverse life’s difficulties and solve everyday problems so that they do not overwhelm us. As Syme puts it, the challenge is ‘how to give people secrets for how they can negotiate their life’ (*Mastering the Control Factor* 9 Nov 1998).

Of course, determining the right time to intervene to alter the social environment and, even more crucially, the most effective kinds of interventions that foster the confident problem solving and situational mastery promoted in this approach are enormously important, not to say complex, questions. Nor does the research discussed here address them fully. Nevertheless as noted above, there are success stories that may have value for the NT (see, for examples, Benzeval & others 1995).

Health transition research

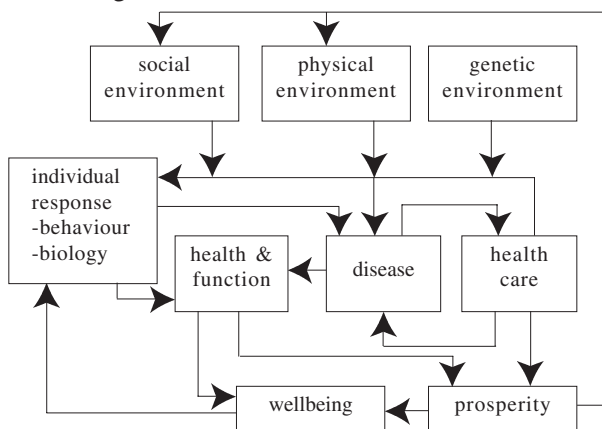
Importantly too, the findings we summarise here converge at significant points with an independent body of research, usually referred to as ‘health transition research’, that has been carried out almost exclusively in so-called Third World countries. This research indicates that universal education, particularly for women but also for men, is strongly predictive of improved health (Caldwell 1993). Formal education in the Third World has, to some extent, performed the kind of empowerment functions now being mooted in a different context. Education enhances people’s skills as well as increasing their confidence to assert their will and, at least for some, challenge and modify existing social relations (Tsey 1997).

Factors influencing health

The relationships between the factors influencing health are complex and comprise several interrelated feedback loops.

As described by Evans & others (diagram 2.1),

2.1 Interrelationships of factors in human wellbeing



Source: Adapted from Evans & others 1994:53

several principles can be drawn from these interrelationships:

- the social as well as the physical environments are crucial primary determinants of health
- genetic factors are important but, with notable exceptions, their expression as specific disease in individuals is mediated by the external social and physical environment
- prosperity and wellbeing are important prerequisites for good health
- the individual’s subjective experience of illness (‘health & function’) is separate from the consideration of disease as an objective clinical category (‘disease’)—this recognises that the same ‘disease’ may be experienced differently and that a patient’s perspective on the effects of illness are not necessarily encompassed by either the treatment or the clinician’s view
- risk factors (smoking, hypertension, obesity, lack of exercise etc) are intermediate determinants of ill health, not underlying causes of ill health
- since risk factors correlate so strongly with socioeconomic status, it is more helpful to understand them as ‘host responses’ to particular external environments rather than simply as individual lifestyle choices freely made
- health care is related to the burden of disease, but also to health and function, and to wellbeing
- the expansion of health care by itself will be insufficient to improve health and function, and may even limit the potential to influence health through other means by diverting scarce resources away from more effective avenues for change

In summary, the research cited here makes three main points that have relevance for our situation in the NT. First, medical science is an essential component of adequate health care but has a limited

potential to improve health—we must contemplate more carefully where those limits are and what they mean for our capacity to improve the health of our communities. Second, the struggle against ‘bad lifestyles’ is necessary but not sufficient to effect health improvements—good health is not just a matter of lifestyle, and lifestyle is not just a matter of choice. Third, changing the social environment is both possible and desirable (Evans & others 1994).

Health inequalities among Territorians

Health research indicating that low position in a social hierarchy in itself is a powerful predictor of health, or that the degree of control an individual is able to exert over their situation has health significance, will come as no surprise to Aboriginal Australians. Indeed, this simply confirms what Aboriginal Territorians (and their counterparts elsewhere in Australia) have always argued. It is the position they have articulated in several key policy documents (see, for example, National Aboriginal Health Strategy Working Party 1989; Royal Commission Into Aboriginal Deaths in Custody 1991; Dodson 1994; Aboriginal Health Policy THS 1996a; National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their Families 1997). Non-Aboriginal social activists, medical practitioners and scholars all have long identified social inequality and powerlessness as the key issue in Aboriginal wellbeing, including health (see, for example, Rowley 1978; Coombs 1978).

The role of dispossession

The present profile of Aboriginal health stems from the dispossession and separation of Aboriginal people from their homelands (THS 1996a). Losing control of their lands resulted in the loss of their economic base (THS 1996a); this was frequently accomplished in an ethos of gross personal violence, brutality and family dislocations. In the NT, it continued well into the lifetimes of contemporary Aboriginal people. Communities of hunters and gatherers became either a convenient workforce for the settlers within the economic system they hastened to establish or unwanted nuisances to be ignored, regulated, moved on or, at times, exterminated.

Even in those areas of the NT (for example, Arnhem Land) where people were not physically dispossessed of their homelands, they nevertheless lost control over them despite remaining in residence. In Arnhem Land,

this was publicly demonstrated when, in the mid 1960s, Yolngu failed in their attempts to prevent bauxite mining on their homelands. In the NT, Commonwealth legislation has enabled some groups to regain legal title to portions of their original lands.

Critics of the priority that Aboriginal people place on land and of the political agenda for land rights argue that neither bring improvements in Aboriginal health; indeed they suggest that twenty years of land rights has produced few health improvements and that priorities must shift to basic services, including water supply, housing, education and so on. However, as Dodson has pointed out, such basic services are every citizen’s right; they should be provided as a matter of course. That aside, the nexus between Aboriginal health and Aboriginal land needs to be more clearly understood, so that we ‘distinguish between ownership of land, in a legal sense, and control over what happens on the land’ (Dodson 1994):

The return of people to their country, or the gaining of other land to live on, is an essential part of grappling with the manifold underlying sources of health problems. But mere ‘ownership’ of land, in the western legalistic sense, will not immediately resolve the historical and contemporary social and cultural pressures which surface in alcohol abuse, violence, physical and mental ill-health. These matters will only respond to the building of a real sense of control in individual and community life.

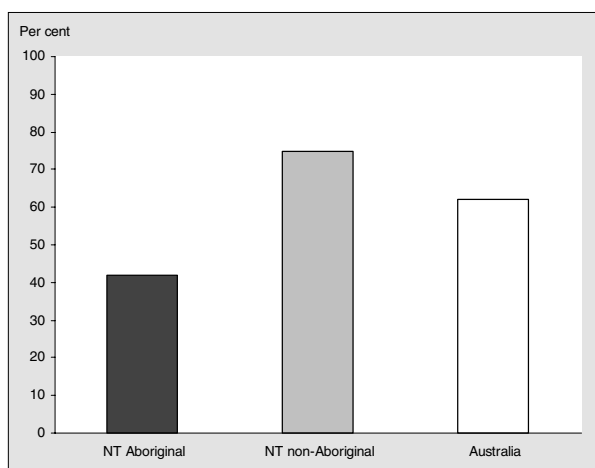
Achieving recognition of land rights is a necessary step on the path to wellbeing. The dispossessed are unlikely to achieve health. This is the position of Aboriginal people. It is also predicted by the model of health determinants we have outlined. Land rights for Aboriginal Australians is thus a public health issue with particular relevance for the NT. That is, however, only part of the story. Under present circumstances, as Dodson argues, it is barely possible for Aboriginal people to control in any real sense what happens on their land, despite owning it, because so many communities are themselves in crisis. His analysis, with its emphasis on the fundamental requirement for Aboriginal people to have control of their lives and of their communities, resonates clearly with the themes articulated earlier in this chapter (Dodson 1994).

The role of employment, income and education

Historically, Aboriginal people have been at the margins of the imposed economic system. This remains the case.

Employment

2.2 NT adults in the labour force 1996



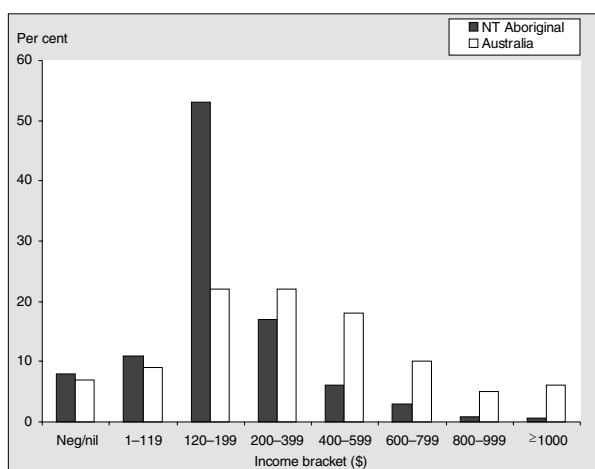
Source: NT—ABS 1998c
Australia—ABS 1998b

The most recent available data show that, in 1996, only 40% of Aboriginal adults were in the labour force compared with nearly 75% of non-Aboriginal Territorians (graph 2.2). Given that this figure of 40% includes those working on CDEP schemes as well as unemployed people who are actively looking for work, the proportion of Aboriginal family incomes at welfare levels is higher than is indicated by the proportion that is shown as in the labour force.

Income

The high proportion of Aboriginal adults who are not in the labour force translates into low levels of income for the majority of Aboriginal families. The largest proportion of adults are welfare recipients of one kind or another.

2.3 Adult weekly income 1996



Source: NT Aboriginal—ABS 1998c
Australia—ABS 1997a

In 1996, about 65% of the NT Aboriginal population had a weekly income of less than \$200 whereas about

35% of Australians overall had a similarly low income (graph 2.3). The poverty brought about by low income levels is reflected in other aspects of life for Aboriginal families.

In 1996, over 10% of Aboriginal Territorians lived in improvised accommodation, including tents. Aboriginal accommodation, of whatever type, tends to be crowded. In 1996, Aboriginal households averaged more than five people per dwelling while NT non-Aboriginal households averaged less than three people per dwelling, similar to the average for all Australians (ABS 1998b; ABS 1998c).

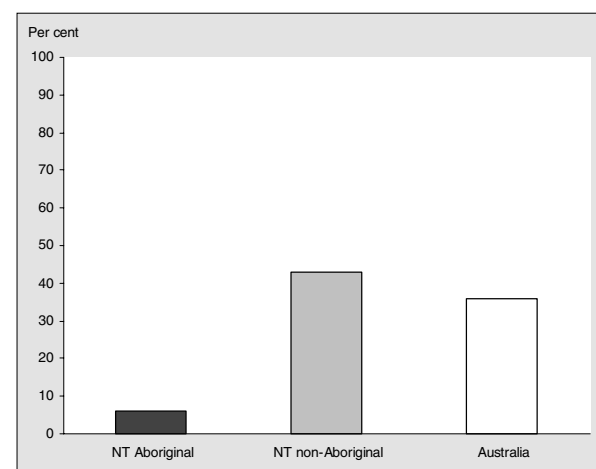
A survey of an NT Aboriginal community in 1997 revealed that only about a third of the showers, sinks, stoves and handbasins in the houses were functional (Hardy 1998).

Most Aboriginal families live in rural and remote regions of the NT. There they experience daily the consequences of a debilitating combination: low income plus extremely high prices plus inadequate services. By way of example: whereas a family dependent on social welfare pays out 23% of their income for a typical basket of food in a capital city, it would take 35% of their income to buy the same basket in an NT Aboriginal community store (Price & McComb 1998).

Quite apart from any other influences, it is evident that outright poverty is a major factor affecting the health and wellbeing of Aboriginal Territorians.

Education

2.4 Adults with a post-secondary school qualification 1996



Source: NT Aboriginal—ABS 1998c
Australia—ABS 1997a

Note: 'Post-secondary school qualification' means at the degree, diploma and vocational levels

Improved levels of Aboriginal engagement in the

economy and society are unlikely without some change in current education and training outcomes.

In 1996, only between 5% and 6% of NT Aboriginal adults had any kind of post-secondary school qualification compared with 40% of non-Aboriginal Territorians (graph 2.4). These education levels are cause only for further alarm, particularly since research shows that (Hunter 1996):

Education is the largest single factor associated with the current poor outcomes for indigenous employment. Indeed, the influence of education dwarfs the influence of most demography, geography and social variables.

Given such poor educational outcomes among today's NT Aboriginal youth, it is unlikely that employment and income opportunities for the families of the next generation will be substantially different without specific intervention. The Australian National University's Centre for Aboriginal Economic Policy Research calculates that, based on 1998 projections, the national Aboriginal unemployment rate is likely to reach 53% by 2006 (Taylor & Roach 1998). Unskilled young Aboriginal people will have difficulty joining the workforce, even more so if they lack literacy and numeracy skills. With trans-generational poverty of this scale already predictable, how can health improvements be achieved?

The health effects of poverty, social inequality and disempowerment

Aboriginal Territorians as a group are worse off than their non-Aboriginal counterparts when rated against the standard indicators of socioeconomic status. That they are also simultaneously enmeshed in a process of pervasive and rapid social as well as cultural change simply adds to the complexity of their situation: long-held community values and authority are challenged; coherent social life is undermined by substance abuse and its related mayhem; ritual and ceremonial pursuits must compete with secular activities; and too-frequent deaths and illness weigh down on families and communities. The disempowerment flowing from this is profound. It leads to 'a spiritual or psychosocial malaise which afflicts much of indigenous Australia and variously surfaces in conditions such as drug and alcohol dependency, and high suicide and accident rates' (Flick & Nelson 1994).

These social conditions (see diagram 2.1) then feed back into the situation, further deepening and

entrenching patterns of dysfunction. The research makes clear that dysfunction itself occurs not only to communities or social groups as abstract entities but is etched into the bodies of the individuals experiencing it, ultimately manifesting as ill health of one form or another.

In the larger national forum too, intense levels of public criticism on many fronts, particularly in the late 1990s, have had a negative impact on Aboriginal peoples' collective sense of belonging to the wider Australian community. There remains considerable (perhaps increasing) resistance from those in authority and among the wider community to Aboriginal people managing their own affairs, and to their attempts to influence the agendas of government, the corporate sector and community organisations.

At the level of the community, the family and the individual, this apparently ever-narrowing set of options sets up precisely the kinds of high stress-high anxiety-low control scenarios described earlier by health researchers. Incrementally and cumulatively over a lifetime, such factors are shaping the health of individuals and families, as well as the following generation of children. As Flick and Nelson note: 'It doesn't take multiple science degrees to appreciate the impossibility of attaining good physical health under such conditions' (Flick & Nelson 1994).

In summary, findings on the social gradient of health are not fundamentally new insights. They are 'new' only insofar as health researchers have now described them quantitatively as well as by the physiological ways in which they operate. Indeed the WHO definition of health cited earlier in this chapter arose within an international context where community empowerment had become, and has remained, a dominant theme. The whole spectrum of community advocacy through consumer groups, women's groups, patient support groups and the like is an expression of people moving to achieve greater control over the circumstances of their lives. The establishment of Aboriginal community-controlled organisations, including health services, is also an expression of the continuing struggle by Aboriginal people to gain a greater measure of control over their lives. In all cases, these levels of control are closely related to, though not synonymous with, the kind of mastery discussed earlier in this chapter.

But if this is not 'new' knowledge, what then explains our slow progress in addressing the underlying conditions of poor health? In the case of Australia,

the inadequate progress (Ring 1998) is disturbing as well as puzzling. Aboriginal Australians, with by far the greatest burden of ill-health, number about 400,000 within one of the world's most affluent nations. Aboriginal people in the NT number about 50,000. What is this chasm between the 'knowing' and the 'doing'? Why is it that across the spectrum of authoritative knowledge only some kinds seem to have the power to cause action? As Evans & others ask (1994):

Why is it that in some areas we know without acting, in others we act without knowing? Or, more generally, why are the standards of evidence required before observations are accepted as knowledge, or knowledge accepted as a basis for action, so stringent for some and so flimsy for others?

Addressing the underlying causes of ill health

The information in this publication describes Territorians against a number of different kinds of measures or indicators of health. These measures or indicators of health need to be conceptually distinguished from the notion of health itself. In an analogy: a signpost points a direction, it is not itself the destination. An important question then is how (or if) the selected measures of health reflect or encapsulate the notion of health? Since the set of possible measures of health is virtually endless, those finally selected need to be explicitly related to the desired overall outcome of improved health.

Health policy and the resource allocations it governs—that critical and most contested dimension of the health endeavour—similarly require explicit, systematic linkage to the notions of health that underlie specific health-related activities. The team involved in social gradient research have developed and disseminated some practical guidelines (Wilkinson & Marmot 1998) to assist governments, policy-makers, service organisations and community groups to address the underlying causes of ill health.

The insight from social gradient research is that health for all of us is critically related to our social position. While absolute poverty, in a global sense, guarantees excessive levels of ill health, relative poverty, social distress, powerlessness and social marginalisation will all, separately or in combination, generate disproportionate amounts of ill health (see inset).

Underlying causes of health and illness: translating scientific evidence into policy and action

The social gradient

People's social and economic circumstances strongly affect their health throughout life, so health policy must be linked to the social and economic determinants of health

Stress

Stress harms health

Early life

The effects of early development, including in pregnancy, last a lifetime; a good start in life means supporting mothers and young children

Social exclusion

Social exclusion creates misery and costs lives

Work

Stress in the workplace increases the risk of disease

Unemployment

Job security increases health, wellbeing and job satisfaction

Social support

Friendship, good social relations and strong supportive networks lead to improved health at home, at work and in the community

Addiction

Individuals turn to alcohol, drugs and tobacco, and suffer from their use, but their use is influenced by the wider social setting

Food

Healthy food is a political issue

Transport

Healthy transport means reducing driving and encouraging more walking and cycling, backed up by better transport

Source: Adapted from Wilkinson & Marmot 1998

The health differential between Aboriginal and other Territorians reflects both poverty as well as social inequality. The health of Aboriginal Territorians will improve when they achieve greater levels of real control over the circumstances of their lives and their communities. This in turn requires concerted attention to the social and physical environments within which people and communities live. A set of appropriate measures of socioeconomic status in the NT need to be developed and integrated with existing measures of health if we are to effectively track progress.

Access to comprehensive primary health care

We emphatically are not suggesting here that only social and economic measures are needed to alter the present situation. Nor are we advocating a simple dichotomy between a 'social' or a 'medical' approach. In light of earlier discussion (and see diagram 2.1), that kind of reductionism would clearly be misleading. Better resourced and more accessible health services, particularly comprehensive primary health care, are an essential part of efforts to improve the status quo. Approximately 70% of Aboriginal Territorians, for example, live outside urban centres (THS 1996a) where they rely for health care on the least-resourced health service sector, primary health care. These remain pressing issues that must be solved.

Equipping people with a sense of mastery

Health education programs that target high risk groups, such as smokers or the overweight, are limited in effectiveness while the circumstances of the individuals in those groups remain unchanged. As Professor Len Syme says: '... if you want people to change their behaviour, you can't do it with proclamations from the top down by experts. Experts need to learn a new way of being an expert, to empower people to participate in the events that impinge on their life' (*Mastering the Control Factor* 9 Nov 1998). The model presented here would argue for greater attention to changing the social and/or physical conditions in which a behaviour pattern consistently occurs. In the case of poor diet, to take one example, that might lead to more concerted action towards improving the food supply in communities (including grappling with its associated political agendas—see inset above) than on programs aimed at working with individuals to influence eating patterns.

Aboriginal people themselves may also lead the way in designing innovative programs that address individual emotional and social wellbeing (Tsey & Every). Programs such as the South Australian Department of Education's family wellbeing, personal development and counselling course offer promise in this regard.

Related to this is the view that it is not specific health information that will necessarily assist individuals and communities, rather it is an as yet less well-defined set of abilities, skills and attitudes that enable people to 'problem solve'. Further work could be undertaken

to analyse successful models or programs of this type for their relevance to the NT. Pertinent to the situation of Aboriginal people, however, is that education—in the formal, institutional sense—is invariably implicated in the process of mastering one's environment. It is also linked directly to employment and income potentials.

There is a straightforward explanation for at least part of the stark health differential between Aboriginal and non-Aboriginal Territorians: inadequate health services delivered into communities where they are needed. The underlying causes—poverty and social inequality—are not only clearly revealed for further analysis but, more importantly, are amenable to planned action.

References

- ABS 1997a, *Census of Population and Housing: Selected Social and Housing Characteristics, Australia*, cat no 2015.0, ABS, Canberra.
- ABS 1997b, *Deaths 1996 Australia*, cat no 3302.0, ABS, Canberra.
- ABS 1998a, *1996 Census of Population and Housing, Aboriginal and Torres Strait Islander People, Australia*, cat no 2034.0, ABS, Canberra.
- ABS 1998b, 'Indigenous Profile, Australia', *Census of Population and Housing: Community Profiles, Australia*, cat no 2020.0, ABS, Canberra.
- ABS 1998c, 'Indigenous Profile, Northern Territory', *Census of Population and Housing: Community Profiles, Australia*, cat no 2020.0, ABS, Canberra.
- ABS & AIHW 1997, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, ABS cat no 4704.0, AIHW cat no IHW2, AGPS, Canberra.
- Anderson I 1988, *Koorie Health in Koorie Hands: an Orientation Manual in Aboriginal; Health for Health-care Providers*, Koorie Health Unit, Health Department, Melbourne.
- Bartlett B 1998, 'Native title, Wik, stolen generations and Aboriginal health', *Central Australian Rural Practitioners Association Newsletter*, vol 28, pp 39–43.
- Benzeval M, Judge K & Whitehead M (eds) 1995, *Tackling Inequalities in Health: an Agenda for Action*, King's Fund, London.
- Caldwell JC 1993, 'Health transition: the cultural, social and behavioural determinants of health in the third world', *Social Science and Medicine*, vol 36, no 2, pp 125–35.
- Coombs HC 1978, *Kulinma: Listening to Aboriginal Australians*, ANU Press, Canberra.

- Declaration of Alma-Ata web site: <http://www.who.dk/policy/almaata.htm>
- Dodson M 1994, *Aboriginal and Torres Strait Islander Social Justice Commissioner Second Report 1994*, AGPS, Canberra.
- Evans RG, Barer ML & Marmor TR (eds) 1994, *Why are some People Healthy and others not? The Determinants of Health of Populations*, Aldine de Gruyter, New York.
- Flick B & Nelson B 1994, *Land and Indigenous Health*, issues paper no 3, Native Titles Research Unit, Australian Institute of Aboriginal and Torres Strait Islander Studies, Canberra.
- Hardy B, 'Taps, showers, kitchen sinks and toilets: anything to do with chronic disease?', *The Chronicle*, THS, vol 2.4, p 1.
- Humphery K, Japanangka MD & others 1998, *From the Bush to the Store: Diabetes, Everyday Life and the Critique of Health Services in two Remote Northern Territory Aboriginal Communities*, Diabetes Australia Research Trust & THS, Darwin.
- Hunter B 1996, *The Determinants of Indigenous Employment Outcomes: the Importance of Education and Training*, discussion paper 115/1996, Centre for Aboriginal Economic Policy Research, ANU, Canberra.
- Hunter EM 1993, *Aboriginal Health and History: Power and Prejudice in Remote Australia*, Cambridge University Press, New York.
- Kunitz SJ 1994, *Disease and Social Diversity: the European impact on the Health of non-Europeans*, Oxford University Press, New York.
- McEwen BS 1998, 'Protective and damaging effects of stress mediators', *New England Journal of Medicine*, vol 338, no 3, pp 171–9.
- Marmot MG, Bosma H, Hemingway H & others 1997, 'Contribution of job control and other risk factors to social variations in coronary heart incidence', *Lancet*, vol 350, no 9073, pp 235–9.
- Marmot M, Ryff CD, Bumpass LL and others 1997, 'Social inequalities in health: next questions and converging evidence', *Social Science and Medicine*, vol 44, no 6, pp 901–10.
- Mastering the Control Factor* (four-part series) November 1998, ABC Radio National, The Health Report (transcripts available at web site: <http://www.abc.net.au/rn>).
- Mathews JD 1997, Historical, social and biological understanding is needed to improve Aboriginal health, *Recent Advances in Microbiology*, no 5, pp 257–334.
- National Aboriginal Health Strategy Working Party 1989, *A National Aboriginal Health Strategy*, National Aboriginal Health Strategy Working Party, Canberra.
- National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their Families 1997, *Bringing them Home: Report of the National Inquiry into the Separation of Aboriginal and Torres Strait Islander Children from their Families*, (Ronald Wilson, Commissioner), Human Rights and Equal Opportunity Commission, Sydney.
- Nurcombe B and others, 'The question of Aboriginal intelligence: the first three years of the Bourke preschool experiment.' *Medical Journal of Australia*, 1973, vol 2, no 13, pp 625–30.
- Price R & McComb J 1998, 'NT and Australian capital cities market basket survey 1998', *Food and Nutrition Update*, THS, no 6, pp 4–5.
- Reid J & Trompf P 1991, *The Health of Aboriginal Australia*, Harcourt Brace Jovanovich, Sydney.
- Ring I 1998, 'A "whole of government" approach needed on Indigenous health', *Australian and New Zealand Journal of Public Health*, vol 22, no 6, pp 639–40.
- Rowley CD 1978, *A Matter of Justice*, ANU Press, Canberra.
- Royal Commission into Aboriginal Deaths in Custody 1991, *Final Report of the Royal Commission into Aboriginal Deaths in Custody*, 5 vols, (Elliott Johnston Commissioner), AGPS, Canberra.
- Saggers S & Gray D 1991, *Aboriginal Health and Society: the Traditional and Contemporary Struggle for Better Health*, Allen and Unwin, Sydney.
- Stilwell F 1996, *Economic Inequality: Who gets what in Australia*, Pluto Press, Sydney.
- Taylor J & Roach L 1998, *The Relative Economic Status of Indigenous People in the Northern Territory, 1991–1996*, discussion paper 156/1998, Centre for Aboriginal Economic Policy Research, ANU, Canberra.
- THS 1996a, *Aboriginal Health Policy 1996*, THS, Darwin.
- THS 1996b, *Corporate Plan 1996–99*, THS, Darwin.
- Tsey K & Every A, 'Evaluating Aboriginal empowerment programs: the case of Family Wellbeing', *Australian and New Zealand Journal of Public Health* (forthcoming).
- Tsey K 1997, 'Aboriginal self-determination, education and health: towards a radical change in attitudes to education', *Australian and New Zealand Journal of Public Health*, vol 21, no 1, pp 77–83.
- Wilkinson R 1996, *Unhealthy Societies: The Afflictions of Inequality*, Routledge, London.
- Wilkinson R & Marmot M (eds) 1998, *The Solid Facts: Social Determinants of Health*, WHO, Copenhagen.

Environmental health

by Janine Tardrew, Xavier Schobben and Jeff Standen

What is environmental health?

The links between people's health and their social and physical environments have been well established over the last few centuries. Improved living and working conditions and better nutrition have led to improved health, particularly to a reduction in communicable diseases. Environmental health infrastructure and housing are today considered fundamental to the improvement of people's health. In urban and industrial areas, where there has been substantial progress in providing clean water and food, safe waste disposal and safe housing, attention has shifted towards emerging health problems and their environmental factors.

All environmental factors have some kind of impact on human health. Some naturally occurring substances can have adverse effects on health. Many other substances are the result of environmental degradation or contamination by human activity. Examples of the impact of the natural and man-made environment on human health, and the resulting high economic costs to society, include: the 1995 South Australian mettwurst contamination; the 1997 hepatitis A outbreak associated with Wallace Lake oysters; and the high incidence of disease caused by inadequate housing and health infrastructure in remote Aboriginal communities. The aim of environmental health is to prevent such factors from adversely affecting people's health.

Environmental health is a multidisciplinary field. There is no single agreed definition of environmental health but, for the purposes of this chapter, environmental health is those aspects of human health determined by physical, chemical, biological and social factors in the environment. Environmental health practice covers the assessment, correction, control and prevention of environmental elements that have the potential to affect human health adversely (National Public Health Partnership 1998).

NT environmental health conditions

Despite the extreme climate and isolation from the rest of Australia, environmental health conditions in the NT's urban centres—Darwin, Katherine, Nhulunbuy, Tennant Creek and Alice Springs—and the NT's rural areas are of a similar standard to those found in urban and rural areas throughout Australia. Food, water and power supplies, household waste and sewage disposal systems, and housing standards all contribute to a safe living environment for urban and rural residents. In remote Aboriginal communities, however, the NT faces significant challenges in these 'traditional' areas of environmental health.

Environmental conditions underpin many health factors. Maintaining good health means being able to undertake basic activities such as bathing, washing clothes and bedding, and preparing food to minimise the risk of spreading disease. All of these activities

Health and the environment: gaining the upper hand over disease

Present standards of health have been achieved only by edging forward the frontiers of knowledge over many centuries so that, ever so slowly, health has gained the upper hand over disease. What is too often forgotten is that the gains slowly made over the environment since close settlement need to be consolidated before knock-out magic bullets against individual diseases can be truly effective. The NT, like the rest of Australia, is a land of contrasts: on the one hand, the affluent world of non-Aboriginals with near perfect environmental conditions strives for immortality while, on the other hand, the Aboriginal world represents very much a nineteenth century picture where many of the early health battles still remain to be fought. Given this imbalance, the main environmental health challenges in the NT concern conditions in remote Aboriginal communities.

Adapted from *An Environmental Survey of Aboriginal Communities 1977-78*, NT Department of Health, 1979.

require functioning infrastructure such as showers or baths, water supply and drainage, and places to store and prepare food safely. Also necessary are adequate and functional systems to remove sewage and household waste that may otherwise harbour disease-causing organisms.

As a result of poor environmental health conditions in remote Aboriginal communities, diseases related to the environment, such as respiratory and gastrointestinal diseases, and eye, ear and skin infections, are common in NT Aboriginal people (Plant, Condon & Durling 1995). Repeatedly, people seek treatment at community health centres or, in more serious cases, hospital but, once 'cured', they often return to the same environmental conditions where the problem arose.

Data limitations

For many of the environmental health issues addressed in this chapter, statistical data are limited or at least dated. The planned development of NT government environmental health surveys for remote Aboriginal communities and the 1999 National Community and Housing Infrastructure Needs Survey seek to address these information gaps.

Environmental health strategies

Environmental health legislation

The NT has a wide range of environmental health legislation, including the *Public Health Act*, *Food Act*, *Poisons and Dangerous Drugs Act*, *Therapeutic Goods and Cosmetics Act*, *Radiation (Safety Control) Act* and regulations made under those acts. Although a number of government departments and authorities have responsibility for developing and enforcing environmental health standards, Territory Health Services (THS) has overall responsibility for environmental health matters in the NT.

THS provides or funds environmental health services in urban and remote communities through its environmental health officers. In 1999, there were 24 environmental health officers (servicing urban and remote NT communities) located in all major NT centres, including three located with the Alice Springs

Town Council. THS also funds ten major Aboriginal communities to employ an Aboriginal Environmental Health Worker.

Environmental health standards

Responsibilities for environmental health are shared by several NT and Commonwealth government agencies. In 1995, NT government agencies Territory Health Services, Department of Housing and Local Government, Power and Water Authority and Office of Aboriginal Development formed the Environmental Health Task Group to develop environmental health standards for the NT. The resulting *Environmental Health Standards for Remote Communities in the Northern Territory* include standards for general environmental health infrastructure, including building (Environmental Health Task Group 1998). These standards were prompted by problems that arose because the *Building Act* does not apply in remote areas of the NT.

From July 1998, compliance with these environmental health standards has been a condition of projects funded by the Indigenous Housing Authority of the NT (IHANT), which delivers housing to Aboriginal Territorians. IHANT is comprised of the seven NT ATSIC regional chairpersons, the two NT ATSIC commissioners, a member from the Commonwealth Department of Social Security and NTG members from the Department of Housing, the Department of Local Government, the Office of Aboriginal Development, the Power and Water Authority and Territory Health Services. IHANT also supports improvements in environmental health by pursuing initiatives such as community housing management programs and dedicating funds to the repair and maintenance of its housing. IHANT has requested the support of NT government departments in collecting environmental health data that will enable it to make decisions based on the areas of greatest need.

Environmental health infrastructure

In 1990, under the National Aboriginal Health Strategy, the Commonwealth allocated resources to the Aboriginal and Torres Strait Islander Commission (ATSIC) to address both primary health and environmental health issues. In 1994, the focus moved to large-scale capital works that targeted environmental health problems. Originally known as

Health Infrastructure Priority Projects, they later became known as National Aboriginal Health Strategy Environmental Health Projects. Between 1994 and 1998 under these schemes, the NT was allocated \$130 million for 48 projects, which included: new housing, housing renovations, new power supplies, new sewerage schemes, upgrading of water supplies, roadworks and drainage works. In 1999, ATSIC committed a further \$82 million for housing and health infrastructure projects in the NT between 2000 and 2003.

Water

Water is essential for sustaining life but contaminated water is a risk to good health. Adequate, safe water is also necessary for hygiene and sanitation to prevent the spread of diseases such as hepatitis A, salmonellosis, shigellosis (dysentery), and skin infections.

The Power and Water Authority (PAWA) provides potable (drinkable) water to urban centres and major remote Aboriginal communities in the NT. Major remote Aboriginal communities are those that have a PAWA-operated power supply system; usually they have more than 75 people, but they can have in excess of 2,000 people.

PAWA is not responsible for the supply and quality of water supplied in mining towns, national parks and Aboriginal outstations. The Commonwealth government retained responsibility for all essential services, including the quality of water supplied to outstations, when the NT was granted self-government in 1978.

The draft PAWA report, *Managing Drinking Water Quality in the NT—The Issues and Strategy*, identified the key NT regional water quality issues as: microbiological compliance, nitrates, dissolved solids, low pH (leading to corrosion), fluoride and water monitoring (PAWA 1998). In recognition of these and other issues, PAWA is developing strategic water supply management plans for individual communities.

Water quality

Although NT legislation does not specify any particular quality for drinking water supplies, PAWA generally complies with the 1987 National Health and Medical Research Council (NHMRC) guidelines and aims to comply by 2001 with the 1996 NHMRC guidelines for microbiological quality for all urban centres. Major urban water supplies—that is, for centres with more than 10,000 people—already comply with the 1996 NHMRC guidelines.

PAWA tests water supplies regularly to monitor water quality. A key indicator of water quality is the absence of coliforms. Coliforms are bacteria found in the intestines of human beings and warm-blooded animals. The presence of coliforms, especially *E. coli*, in drinking water supplies is a good indication of faecal contamination. According to the 1987 NHMRC guidelines, 95% of water samples should be free of coliforms in water supply systems intended for drinking. The 1996 NHMRC guidelines increased this benchmark to 98%. The changes in these guidelines reflect the target of continuous improvements in quality.

Urban

In accordance with the guidelines, PAWA tests the water supplies in Darwin and Alice Springs weekly, Katherine fortnightly, and Tennant Creek and Yulara monthly.

3.1 NT urban water supply: microbiological compliance

Urban Centre	Coliform-free		
	1995–96	1996–97	1997–98
Target for compliance	95%	95%	95%
Darwin	97.0	97.6	94.4
Katherine	98.0	98.0	99.1
Alice Springs	100.0	100.0	100.0

Source: Adapted from PAWA 1998

Almost without exception, the NT's major urban centres met the targets for compliance with the 1987 NHMRC guidelines in the three years to 1997–98 (table 3.1). Darwin's lower 1997–98 figure included two water storage and emergency installations that were not used for prolonged periods; all other water supply installations complied with the NHMRC guidelines.

Remote

PAWA tests the water supplies of all 75 major NT Aboriginal communities each month for microbiological compliance with the 1987 NHMRC guidelines. One-third of these water supplies are chlorinated, the remaining two-thirds are microbiologically-compliant protected ground water sources (bores).

3.2 NT major remote Aboriginal communities' water supply: microbiological compliance

	Samples No.	Coliform-free %
1995–96	1,960	84.5
1996–97	1,855	88.2
1997–98	1,810	92.1

Note: Remote Aboriginal communities with a PAWA-operated power supply system

Source: Adapted from PAWA 1998

Water quality improved in the NT's major Aboriginal communities in the three years to 1997–98 (table 3.2), although it did not yet universally meet the 95% microbiological compliance in the 1987 NHMRC guidelines.

The *Australian Drinking Water Guidelines 1996*, which specified more stringent compliance and testing regimes, replaced the 1987 NHMRC guidelines. The 1996 guidelines were developed to assist in improving local water quality standards, although widespread criticism of the guidelines has resulted in their being reviewed. PAWA's 1998 draft report found that, through continuous improvements and intersectoral collaboration, compliance with the 1987 NHMRC guidelines had increased between 1993 and 1998 from 50% to 80% in communities with between 150 and 300 people.

Access to water

Remote

The 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS) found that about 6% of Aboriginal households on outstations in the NT were without running water (ABS 1996).

Another issue affecting access to water is water restrictions caused by drought or equipment breakdown. The reasons for water restrictions include bores not operating because of unreported equipment

failures, insufficient fuel, open valves on tanks allowing water to be released, and blocking of filtration systems.

Sewage disposal

Sewage, untreated human and household waste that may harbour disease-causing organisms, needs to be disposed of in a manner that minimises public health risks. Also, the method of sewage treatment and disposal should not encourage mosquitoes to breed—another way of transmitting disease—or allow people access to sewage or effluent.

In the late 1990s, on-site sewage disposal, such as septic tanks, was regulated in the NT by the *Code of Practice for Small On-site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent* (THS 1996).

On-site sewage disposal is a problem in some rural residential areas as a result of seasonal flooding, rising watertables (when the ground becomes saturated) and poorly draining soils, all of which are particularly evident in the Top End.

On-site sewage disposal is also widely acknowledged as a major environmental health problem in many remote Aboriginal communities.

Remote

3.3 Remote Aboriginal communities and outstations with no sewage disposal system

State	Communities Surveyed	Communities Affected		People Affected
	No.	No.	%	No.
NSW	65	0	0	0
Vic	1	0	0	0
Qld	77	8	10	425
SA	94	8	9	36
WA	178	27	15	1,196
Tas	1	0	0	0
NT	489	94	19	1,900
ACT	1	0	0	0
Australia	906	137	15	3,557

Source: Adapted from ACS 1993

In 1992, Australian Construction Services (ACS) reported that almost one in five NT Aboriginal communities and outstations surveyed was without a

sewage disposal system, and all of the 94 NT Aboriginal communities without a sewage disposal system were outstations (table 3.3). In the other NT Aboriginal communities surveyed, only 66% of on-site sewage systems worked satisfactorily. PAWA serviced off-site sewage disposal systems on 36 remote NT Aboriginal communities but was not responsible for on-site disposal of effluent, the most common method being septic tank systems.

Problems with sewage disposal are caused mainly by septic tank systems that are out of order or faults with household plumbing, including the toilet itself. Even when installed and maintained correctly, septic tank systems break down when more people use them than they were designed to cope with.

Small on-site septic tank systems were designed to service household occupancy levels experienced by the wider Australian population. They become overloaded in remote Aboriginal communities where housing shortages mean they may be used by large or fluctuating numbers of people (Pholeros, Torzillo & Rainow 1993).

As a result of heavy usage, excess water, particularly sullage from a shower or washing machine, can saturate and clog the trenches. The effectiveness of septic systems is sometimes compromised in one or other of the following ways: poor design, installation and construction; effluent disposal areas being crushed, especially by motor vehicles; material such as rocks being dropped into septic tanks; and objects being flushed down the toilet, blocking the pipes.

Housing

Housing can have an immediate impact on health because it provides the facilities to undertake healthy practices, such as preparing and storing food safely, washing people and clothing, and disposing of waste (Nganampa Health Council Inc & others 1987). In urban areas of the NT, housing standards are generally of the same high quality as elsewhere in Australia.

In remote communities, an acute shortage of housing has resulted in overcrowding. Available housing was not designed to support occupancy levels of between 15 and 20 people, as is often experienced.

Overcrowding is exacerbated by insufficient basic health hardware and poor maintenance, the latter largely the result of a lack of regular maintenance systems. All of these factors undermine healthy living practices. In the late 1990s, these issues have been addressed by IHANT and the *Environmental Health Standards for Remote Communities in the Northern Territory* (see section on Environmental health standards earlier in this chapter). Nevertheless, more houses are needed to significantly reduce housing occupancy rates and improve the living conditions of Aboriginal Territorians on remote communities. The provision of new houses also requires housing design and house orientation that recognises the traditional and cultural relationships within the community.

In the 1994 National Aboriginal and Torres Strait Islander Survey (NATSIS), approximately 43% of respondents (both urban and remote) expressed dissatisfaction with their dwelling. The reasons given included:

- needing repair—60%
- inadequate bathing facilities—45%
- not enough bedrooms—65%
- not enough living area—62%
- needing better insulation or ventilation—39%

In the 4 weeks before the NATSIS survey, 16% of Aboriginal households surveyed in the NT had been affected by a breakdown in one or more utilities—water, toilet, electricity or gas (ABS & AIHW 1997).

Remote

The 1996 Census found that, Australia-wide, Aboriginal households averaged 5.4 people whereas each non-Aboriginal household averaged 2.7 people (ABS 1998).

Overcrowding was a particular problem in the NT, which had an average of nine people in each household in remote Aboriginal communities (ABS & AIHW 1997). This high occupancy rate places a heavy load on household infrastructure, accelerating the breakdown of health hardware such as showers, toilets and washing machines.

The key challenge in addressing this housing shortage is the estimated high level of resources required to meet the backlog, not only in providing new houses, but in repairing and maintaining existing housing so that it can continue to be occupied safely.

3.4 Estimated cost of providing and/or repairing Aboriginal housing 1992

State	Housing		Total (\$million)
	New (\$million)	Repairs (\$million)	
NSW	168	49	217
Vic	28	2	30
Qld	280	106	386
SA	51	11	63
WA	200	32	233
Tas	0	0	0
NT	360	78	438
ACT	1	1	2
Australia	1,088	280	1,369

Source: Adapted from ACS 1993

In 1992, ATSI's HCINS estimated that, Australia-wide, the NT had the highest need for funds to provide and/or repair housing for Aboriginal people (table 3.4).

The NT government's Aboriginal Housing Strategy estimated that 5,100 houses needed to be built between 1992 and 2001: 3,100 dwellings to clear the backlog of unmet housing need; and another 2000 dwellings to keep up with the demand from people forming new households. According to the then NT Department of Lands, Housing and Local Government, 'Allowing \$150,000 per house for construction, land servicing and administration in 1992 dollars, funding for new houses over the ten year period will be \$765m. This estimate does not include

provision for future consumption of assets, the construction of headworks for essential services [such as water and sewerage] or recurrent funding' (NTLHLG 1992).

Poor condition of dwellings

ATSI's 1992 HCINS revealed the high level of repairs needed for existing houses (table 3.5) and the significant number of people living in shelters—humpies, sheds and other improvised dwellings. This was the first national assessment of the condition of Aboriginal housing.

More recent work in the NT includes the 1997 pilot of an Environmental Health Infrastructure Maintenance System, which collected basic data from five remote Aboriginal communities in the NT. The level of poor performance of household infrastructure was significant, averaging over the five communities:

- 50% non-functioning showers
- 30% non-functioning toilets
- 25% waste water pooling inside the house
- 50% unsafe electrical fittings
- 50% non-functioning cooking facilities

These findings should be treated with caution because of shortcomings in the survey forms used. Nevertheless, the causes of infrastructure failure were similar to the Housing for Health projects at Pipalyatjara (Pholeros, Torzillo & Rainow 1993) and Pormpuraaw in Queensland (Pormpuraaw Community Council & others 1997), which found a higher failure rate in household infrastructure.

3.5 Aboriginal housing: condition of houses

State	Work Required				Total	Shelters
	No repairs	Minor repairs	Major repairs	Replacement		
NSW	829	231	461	466	1,987	366
Vic	95	30	29	9	163	94
Qld	1,230	522	667	903	3,322	488
SA	208	139	133	67	547	168
WA	746	300	642	72	1,760	527
Tas	35	0	0	1	36	0
NT	1,832	1,109	952	254	4,147	1,254
ACT	12	1	16	7	36	4
Australia	4,987	2,332	2,900	1,779	11,998	2,901

Notes: Condition of houses owned and/or administered by Aboriginal and/or Torres Strait Islander organisations
'Shelters' mean improvised dwellings

Source: Adapted from ACS 1993

3.6 The effect of a repairs & maintenance program in a remote Top End community

Health Hardware	% Houses	
	1997	1998
Electrically safe	37	79
Hot water	42	61
Functional		
Shower	30	81
Handbasin	35	77
Laundry tub	30	70
Washing machine on site	35	42
Kitchen sink	33	84
Stove (minimum of 2 hot plates working)	35	61
Kitchens (cupboards with doors and a bench with a smooth, impervious surface)	35	67
Toilet	65	56*
Water pooling in house	26	30
Floor, wall or ceiling repairs required	40	28

Note: *Lower than expected because of sewerage blockage that was later repaired

Data: Environmental Health Branch, THS

The impact of improvements through a housing maintenance program was substantial in one remote Top End Aboriginal community that was involved in the 1997 pilot and again surveyed in 1998 (table 3.6). The community council's repairs and maintenance program led to a marked improvement in the functionality of household infrastructure. This was accompanied by a reduction in illnesses associated with poor environmental health conditions over the same period (see inset).

The results of this project, though different in method, supported those of the Housing for Health projects at Pipalyatjara (Pholeros, Torzillo & Rainow 1993) and Pormpuraaw (Pormpuraaw Community Council and others 1997), two other remote Aboriginal communities where improving household infrastructure resulted in improvements in health.

Mosquito control

The potential for transmitting disease via mosquito bites is one of the biggest insect control issues in the NT for both remote and urban areas. Factors that

Improving health by improving housing

One remote Aboriginal community council consulted with its members and local tradesmen before the 1997 pilot of an Environmental Health Infrastructure Maintenance System, then decided to spend its \$100,000 Indigenous Housing Authority Grant on a program to repair and maintain the community's houses.

The money was used for repairs identified in a survey of household infrastructure (health hardware), which includes taps, showers, basins, hot water systems, toilets, kitchen sinks and laundry tubs.

The THS Environmental Health Officer and a team of local Environmental Health Workers, who carried out the original survey in July 1997, gave a list of the necessary repairs to the local plumber, builder and electrician to carry out with the assistance of local teams where possible.

After a year's work on these repairs, the survey was repeated. It found a substantial improvement in the functionality of most of the health hardware (see table 3.6).

Subsequent analysis of the health centre data in this community showed a marked reduction in the incidence of illnesses that are transmitted more readily in poor environmental health conditions.

Health centre data for the six months before the repairs and maintenance project (February to July 1997) were compared with data for the last six months of the project (February to July 1998). The results were decreases in:

- skin infections/scabies—69%
- chest infections/acute respiratory infections—39%
- diarrhoea/vomiting—36%

The decreases in health centre visits were consistently greater at this community than at two nearby communities, which had no systematic repairs and maintenance program at the time. The lack of a significant decrease in the number of visits for trauma (1.75%), a condition unlikely to be affected by housing repairs, suggests that the results were not caused by a drop in the use of the clinic but, rather, were a result of the repairs and maintenance program.

place people in the NT, particularly the Top End, at risk include:

- warm climatic conditions and places for mosquitoes to breed near communities
- the presence of mosquito-borne viruses such as Murray Valley encephalitis, Kunjin, Ross River and Barmah Forest viruses
- nearby countries with mosquito-borne diseases such as malaria, Japanese encephalitis and dengue

The extent of known mosquito-borne disease in the NT (table 3.7) is likely to be underestimated because recorded cases concerned people who have laboratory analysis of their blood after seeking medical attention. It should be noted that malaria was not contracted locally in the late 1990s; similarly, the species of mosquito responsible for spreading dengue fever was not found in the NT.

THS entomologists coordinate mosquito surveillance, monitoring and control in cooperation with environmental health officers, local councils and other government departments.

NT surveillance and control methods include:

- sentinel flocks of chickens tested regularly for advance warning of Murray Valley encephalitis, Kunjin and Japanese encephalitis in areas between Darwin and Alice Springs
- checks at likely entry points for mosquito species not present in the NT

- weekly monitoring of mosquito numbers and types at Darwin, Alice Springs, Tennant Creek, Katherine, Jabiru and Nhulunbuy
- helicopter spraying of biological insecticides to control mosquitoes in saltwater marshes around Darwin
- drainage or infill to remove mosquito breeding sites
- raising public awareness of mosquito-borne disease
- advice to land developers to avoid mosquito and biting midge breeding sites
- viral studies on mosquitoes collected from places where disease occurs

Food supply

The NT presents increased risk factors for safe food supply and preparation because of the hot climate and outdoors lifestyle. Bacteria and viruses cause most intestinal illness—for example, campylobacter, salmonella, and norwalk and norwalk-like viruses. The true extent of food-related illness in the Territory is difficult to determine because much of it is unrecognised and unreported. For more information about food supply, see the Food and nutrition chapter.

3.7 NT mosquito-borne disease

NT Mosquito-borne Disease	1990–91	1991–92	1992–93	1993–94	1994–95	1995–96	1996–97	1997–98
Imported malaria	42	32	37	33	45	24	38	29
Malaria cases requiring control	1	3	0	2	1	1	1	1
Ross river virus (epidemic polyarthritis)	497	195	286	347	377	117	235	127
Australian encephalitis	3	0	6	0	0	0	4	0
Dengue fever (local)	0	0	0	0	0	0	0	0
Barmah forest	—	40	15	32	13	23	44	21

Data: Medical Entomology Branch, THS

Notes: Numbers confirmed by laboratory analysis of blood tests

'Imported malaria' means contracted overseas

'Malaria requiring control' means cases where adult mosquito fogging may be required

Remote

Having access to safe and adequate food supplies is a concern in remote areas. As well as the difficulties faced within the home because of the high incidence of houses without adequate kitchen facilities (see Housing earlier in this chapter), often there are difficulties with food supply in the local store.

Air

The NT has superior air quality compared with elsewhere in Australia, because a small population and corresponding limited industrial base do not produce the same problems of photochemical pollution. Motor vehicle emissions, wind-borne dust, and smoke from bushfires and waste burning are responsible for most of the air pollution in the NT. Pollution from overseas sources, such as the 1997 Indonesian bushfires, also impacts on local air quality.

Power supply

An adequate power supply is pivotal to sustain good health. Inadequate or unreliable power supplies make it difficult to ensure safe food storage, particularly in the desert and tropical climates of the NT where temperatures are regularly between 30°C and 40°C. People in rural areas often rely on diesel-generated power, sometimes supplemented by solar power.

Remote

PAWA provides most major remote Aboriginal communities with a power supply 24 hours a day. Generally, PAWA provides day-to-day operations and maintenance through a period contract with the community council. As PAWA is not responsible for providing power supplies to outstations, they have either their own generators or solar power systems, or they have no power supply. The responsibility for power supply to Aboriginal outstations in the NT remains with the Commonwealth government.

3.8 Remote Aboriginal communities and outstations with no electricity supply

State	Communities			People Affected No.
	Surveyed No.	Without Electricity No.	%	
NSW	65	2	3	16
Vic	1	0	0	0
Qld	77	29	38	2,804
SA	94	20	21	190
WA	178	44	25	1,821
Tas	1	0	0	0
NT	489	156	32	3,607
ACT	1	0	0	0
Australia	906	251	28	8,438

Source: Adapted from ACS 1993

ATSIC's 1992 HCINS found that 3,607 people living on 156 outstations in the NT had no electricity supply (table 3.8). Almost all of these people (3,416) lived on outstations (150).

References

- ABS 1995, *1994 National Aboriginal and Torres Strait Islander Survey: Detailed Findings*, cat no 4190.0, Canberra.
- ABS 1996, *National Aboriginal and Torres Strait Islander Survey, Housing Characteristics and Conditions, 1994*, cat no 4187.0, Canberra.
- ABS 1998, *1996 Census of Population and Housing, Aboriginal and Torres Strait Islander People, Australia*, cat no 2034.0, Canberra.
- ABS & AIHW 1997, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples*, ABS cat no 4704.0, AIHW cat no IHW2, AGPS, Canberra.
- ACS 1993, *1992 National Housing and Community Infrastructure Needs Survey*, ATSIC, Canberra.
- Environmental Health Task Group 1998, *Environmental Health Standards for Remote Communities in the Northern Territory*, NTGP, Darwin.
- Jones R 1994, *The Housing Need of Indigenous Australians, 1991*, Centre for Aboriginal Economic Research Policy research monograph no 8, ANU, Canberra.

- National Public Health Partnership 1998, *Environmental Health in Australia: Towards a National Strategy*, H&FS, Canberra (web site: <http://www.health.gov.au/pubhlth/strateg/envhlth/drstrat/>).
- Nganampa Health Council Inc, South Australian Health Corporation & Aboriginal Health Organisation of South Australia 1987, *Report of Uwankara Palyanyku Kanyintjaku: An Environmental and Public Health Review within the Anangu Pitjantjatjara Lands*, Nganampa Health Council Inc, South Australian Health Corporation & Aboriginal Health Organisation of South Australia.
- NLHLG 1992, *Northern Territory Aboriginal Housing Strategy*, Darwin.
- NLPE & THS 1995, *Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory*, Environmental Health Program, THS, Darwin.
- NHMRC 1987, *Guidelines for Drinking Water Quality in Australia*, Canberra.
- NHMRC 1996, *Australian Drinking Water Guidelines 1996*, Canberra.
- NTH 1979, *An Environmental Survey of Aboriginal Communities 1977–1978*, Darwin.
- PAWA 1996, Draft service delivery guidelines for power, water and sewerage services to rural communities and outstations (unpublished report), Darwin.
- PAWA 1998, Managing drinking water quality in the NT—the issues and strategy (unpublished draft report), Water Quality Management Group, Darwin.
- Pholeros P, Torzillo P & Rainow S 1993, *Housing for Health, Towards a Healthy Living Environment for Aboriginal Australia*, Healthabitat, Sydney.
- Plant AJ, Condon JR & Durling G 1995, *Northern Territory Health Outcomes, Morbidity and Mortality 1979–1991*, NTH&CS, Darwin.
- Pormpuraaw Community Council, Apunipima Cape York Health Council, Centre for Appropriate Technology & Healthabitat 1997, *Pormpuraaw Housing for Health Project Report, Towards a Health Living Environment for Cape York Communities*, Centre for Appropriate Technology, Cairns.
- THS 1996, *Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent*, Environmental Health Program Directorate, Darwin.

Food and nutrition

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This chapter discusses information about food and nutrition in the NT, in particular: aspects of the supply, cost and consumption of food in urban and remote areas; important factors in the nutrition of mothers and children; and available data about Territorians' body size and physical activity.

Food

Supply

The NT is heavily dependent on an imported food supply because of its geographic location, climatic influences and sparse population. Vast distances from main production centres, and also between towns within the NT, add to difficulties with the range, type and cost of food available in the Territory. Inequities in food supply are especially evident in remote communities where there is frequently only one commercial food outlet, prices are high and a limited range of foods offer a diet that is often high in fats and sugars and low in fruit and vegetables. These factors result in poor nutrition and health outcomes for vulnerable community groups such as Aboriginal people who live in remote communities.

Most of the food eaten by Territorians originates from southern centres. About 90% of all fruit and vegetables consumed comes from interstate. Only about 30% by weight and 15% by value of Territory horticulture, which includes a range of tropical fruit and vegetables, is actually sold within the NT (Cann 1995). This may be because NT producers obtain higher prices in interstate and international markets, and Territory residents apparently prefer fruit and vegetables from a temperate climate. Through the establishment of regular local markets in Darwin, tropical fruit and vegetables have risen in popularity with tourists and locals.

Much of the food eaten by NT people is prepared outside the home (THS 1995). Even in remote communities, the takeaway has become firmly entrenched, often offering longer trading hours than the local store. Anecdotal reports from some communities suggest that takeaway sales have surpassed those of the local store.

Urban

The range of foods available in Darwin and Alice Springs is similar to that offered in other larger cities in Australia. Except for Tennant Creek, at least one of the two national food retailers (Coles and Woolworths) is represented in each of the NT's urban centres—Darwin, Alice Springs, Katherine, Tennant Creek and Nhulunbuy. These retailers are supplemented by smaller convenience stores. In Darwin, locally-grown tropical fruit and vegetables are readily available.

Remote

The availability of certain foods, especially fresh fruit and vegetables, decreases as distance increases from the NT's main urban centres.

A 1998 NT-wide survey of community stores found that cost, availability and quality of food were the major issues in remote communities. On average, there were seven kinds of fruit and 12 kinds of vegetables in the 45 community stores surveyed. This compared with approximately 30 kinds of fruit and 80 kinds of vegetables available through a national retailer in Darwin. Although this may suggest that community stores offer a reasonable range of fruit and vegetables, often there were only small quantities of each item. In general, the quality of fruit and vegetables offered for sale was reasonable. This survey was undertaken at the beginning of the 1998 dry season; the situation may have been quite different in the wet season, at least in the Top End, when flooding affects food supplies to remote communities (THS 1998).

Cost

The average cost of food in the NT is higher than in southern capital cities, and considerably higher again in NT remote communities (see tables 4.1 and 4.2).

Efficient and reliable transport is essential to ensure an adequate food supply, and the cost of transport contributes to higher food costs in the NT. Road transport is the most common means of carrying food

into and within the NT, where approximately 70% of all food is moved by road; barge and rail together account for about 30%; air transport of food is not considered significant (Hughes 1995). In 1995, there were seven major interstate food transport companies operating in the NT and food was distributed primarily through 17 major wholesalers and retailers (THS 1995).

In 1998, in cooperation with local communities and store managers, THS costed a healthy basket of food in stores throughout the NT. Student nutritionists costed the same basket of food in each southern capital city. Based on NHMRC recommendations (Cashel & Jeffreson 1995), the hypothetical basket contained foods to meet the average energy and nutrient needs of a family of six people for a fortnight.

Urban

Overall, the cost of the healthy basket of food in

Darwin and Alice Springs was 10% to 11% higher than in southern capital cities (table 4.1). Fruit was the most expensive food group, averaging 28% more in Darwin and 23% more in Alice Springs than in southern Australian capital cities. The cost of fruit was highest in Katherine and the cost of vegetables was highest in Nhulunbuy, which generally had the most expensive food of the NT's five urban centres.

Remote

In remote NT communities, families had to pay consistently more to meet their requirements for fruit and vegetables: for example, the cost of vegetables in Katherine and East Arnhem remote communities was over 70% more expensive than in the southern capital cities (table 4.2). In other remote NT communities, the situation was only marginally better.

4.1 NT urban centres: food costs 1998

	Breads & Cereals	Fruit	Vegetables	Meat & Alternatives	Dairy	Margarine & Sugar	Total Basket
Percentage of capital city average							
Darwin	99	128	104	103	111	106	110
Alice Springs	108	123	109	102	109	99	111
Tennant Creek	96	112	119	113	122	123	113
Katherine	93	134	119	107	118	122	117
Nhulunbuy	130	124	166	127	119	146	134
Capital city average	\$50	\$78	\$64	\$51	\$53	\$13	\$309

Notes: NT stores survey conducted April to May 1998
 'Capital city average' is all Australian capital cities except Darwin

Source: Food & Nutrition Unit, THS

4.2 NT remote communities: food costs 1998

	Breads & Cereals	Fruit	Vegetables	Meat & Alternatives	Dairy	Margarine & Sugar	Total Basket
Per cent of capital city average							
Darwin remote	145	161	156	145	151	156	153
Alice Springs remote	131	129	162	140	155	152	143
Barkly remote	137	161	146	151	165	155	153
Katherine remote	147	173	172	142	145	159	158
East Arnhem remote	162	161	179	158	158	167	164
Capital city average	\$50	\$78	\$64	\$51	\$53	\$13	\$309

Notes: NT stores survey conducted April to May 1998
 'Capital city average' is all Australian capital cities except Darwin

Source: Food & Nutrition Unit, THS

Diet

Urban

Data on the eating habits of NT urban people is limited. The 1995 National Nutrition Survey (sample size 357) confirmed that the diet of people in NT urban centres was similar to that of the rest of Australia; one noticeable difference was the NT's higher per capita consumption of soft drink, alcohol and flavoured milk (ABS & H&FS 1997). QUF Industries Business Development Manager Kevin Benson advised that, in 1998, annual average consumption of iced coffee was about 6.5 litres per person Australia-wide compared with 47 litres per person in the NT.

A 1994 ABS home consumption survey in Darwin revealed that 42% of people had eaten out or had takeaway food the previous day (Gough & McComb 1997). Both McDonalds and Hungry Jacks broke national records when they opened branches in Darwin; McDonalds sold over 40,000 meals in its first week of operation (*Northern Territory News* 13 Oct 1994, p 6). In addition, over one million tourists visit the Territory each year and consume foods from commercial retail outlets (Hughes 1995). Many takeaway foods are high in fat, salt and sugar, and low in fibre and complex carbohydrate.

In the NT, small-scale horticulture ventures are expanding rapidly. Growers provide tropical fruit and vegetables to the very popular markets at Parap, Rapid Creek, Nightcliff and Mindil Beach in Darwin and

also at Palmerston; an array of ethnic foods is also available at these markets. These foods make a significant contribution to the diet of many people in Darwin.

Remote

Information about turnover of food items in NT remote community stores is used to indicate the diet of the people, primarily Aboriginal, who live in those communities. The community store is usually the only commercial food outlet in each community.

The most recent available data suggests that only 3% to 6% of energy consumed on average by Aboriginal people in NT remote communities is supplied from bush foods, with the rest coming from foods purchased at community stores (Lee 1992). This data was gathered in 1989 and 1990; there is a need to obtain more up-to-date information that focuses on key food groups.

A 1989 and 1990 survey of foods sold in NT remote community stores revealed that, compared with NHMRC recommended daily intake and Australia-wide eating habits in 1995, the diet of NT Aboriginal people was high in meat and low in fruit and vegetables (table 4.3).

4.3 NT remote communities: daily diet 1989 to 1990

Core Food Group	Type	NT Remote Communities	Recommended	Australia
Cereal foods	bread	13 slices (330 g)	10 slices (270 grams)	13 slices (332 g)
Fruits	apples	half (70 g)	three (450 g)	one (143 g)
Vegetables	cooked	0.4 cups (60 g)	3 cups (450 g)	1.7 cups (269 g)
Meat & alternative	palm-sized steaks	two (205 g)	one (120 g)	two (198 g)
Milk & equivalent		not recorded	2 cups (500 ml) fat reduced	1.25 cups (290 ml)

Notes: 'NT Remote Communities' is based on store turnover data (Lee 1992)

'Recommended' is NHMRC recommended daily intake (Cashel & Jeffreson 1995)

'Australia' is average consumption of Australian males and females aged 19 and over (ABS & H&FS 1997)

Source: Food & Nutrition Unit, THS

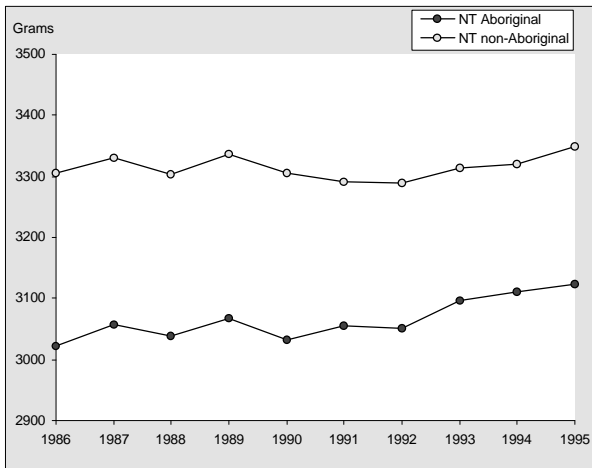
Nutrition

Mothers and children

Birth weight

Babies can be lower than expected in birth weight because they are born early (prematurely) or they do not grow adequately before birth (intrauterine growth retardation) or for both reasons. Studies in the Darwin rural area (Rae 1989; Sayers & Powers 1997) and the evaluation of the Strong Women, Strong Babies, Strong Culture program (Mackerras 1998) show that both problems exist in the NT.

4.4 NT babies: birth weight 1986 to 1995



Note: Average birth weight of live births

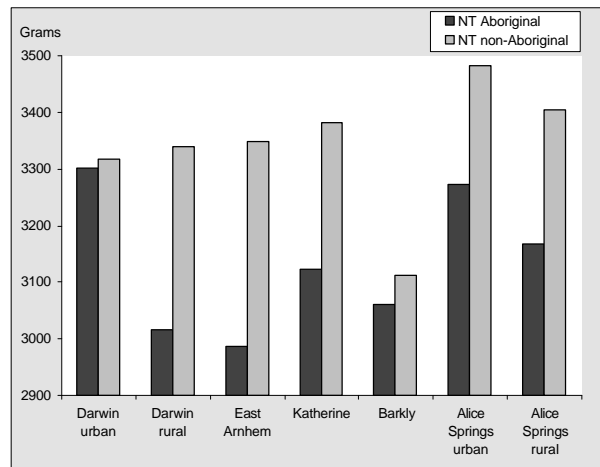
Source: Adapted from Markey & others 1998

In 1995, the average birth weight of NT Aboriginal babies was 3,123 grams, an increase of 85 grams over the previous 10 years (graph 4.4). However, this was still lighter than the average birth weight of non-Aboriginal infants, 3,348 grams.

In 1995, there was a wide variation in the weight of Aboriginal infants across the NT; babies born in East Arnhem were substantially lighter than those born elsewhere in the NT (graph 4.5).

For more information about birth weight, see the Children’s health and welfare chapter.

4.5 NT babies: regional differences in birth weight 1995



Note: Average birth weight of live births

Source: d’Espaignet & others 1997

Mothers’ weight

The nutritional status of mothers—in particular, their height and weight before pregnancy and the amount of weight they gain during pregnancy—influences the growth of their babies before birth. Although this data is collected in the NT, it is not readily accessible for data analysis.

Data from the evaluation in three remote Top End communities of the Strong Women, Strong Babies, Strong Culture program found that (Mackerras 1998):

- the weight of the Aboriginal women before pregnancy was much lower than the national average
- the amount of weight they gained during pregnancy (average 10 kg) was also lower than NHMRC recommendations (NHMRC 1979)

Low maternal weight before pregnancy and low weight gain during pregnancy are significant risk factors for low birth weight (Rae 1989). The Strong Women, Strong Babies, Strong Culture program was designed specifically to focus on these factors. In consultation with Aboriginal women and health workers, it aims to develop bicultural strategies that reduce poor nutrition and infection during pregnancy (Fejo & Rae 1996).

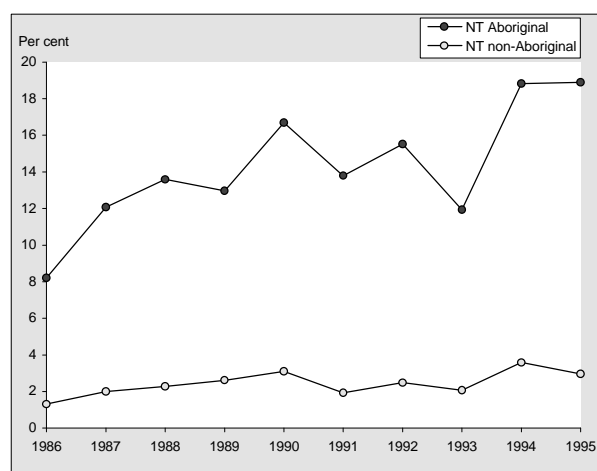
Anaemia

Information about the prevalence of anaemia in children aged under five years began to be collected in remote NT Aboriginal communities in 1998, but further research will be needed to determine the proportions of anaemia attributable to particular causes such as:

- parasites
- low consumption of foods that are rich in iron and folate
- factors that inhibit the absorption of iron

Most anaemia in pregnant women results from a deficiency of iron, although it can sometimes result from a deficiency of folate. Low folate in mothers is associated with low birth weight of their babies (Scholl & others 1996) and neural tube (spinal cord) defects such as spina bifida. Folate is a B vitamin that is found in various fruits, vegetables and wholegrain cereals, and is added to foods such as cold breakfast cereals.

4.6 Anaemia in pregnant women in the NT 1986 to 1995



Note: Pregnant women diagnosed with anaemia

Source: Adapted from Markey & others 1998

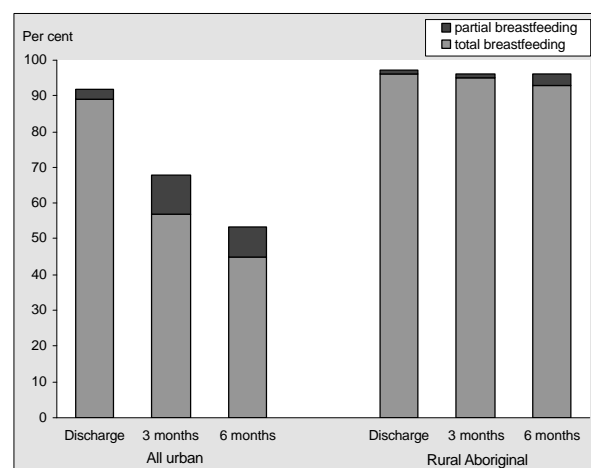
The proportion of pregnant NT Aboriginal women diagnosed with anaemia rose from 8.2% to 18.9% between 1986 and 1995; this may signify better detection of anaemia rather than a true increase (graph 4.6). Mackerras's 1990 to 1996 study of Aboriginal women in three remote Top End

communities found that the prevalence of anaemia among pregnant Aboriginal women was even higher at 41.3% (Mackerras 1998). In 1995, the prevalence of anaemia in NT non-Aboriginal women was only 3% (Markey & others 1998).

Breastfeeding

In 1992 and 1993, NT research recorded the breastfeeding rates at the time women were discharged from hospital after giving birth, three months later and six months later. This found that the NT had Australia's highest breastfeeding rates for both Aboriginal and non-Aboriginal people (Rae 1993).

4.7 NT breastfeeding rates 1992 to 1993



Source: Adapted from Rae 1993

In 1992 and 1993, NT breastfeeding rates indicated that Aboriginal mothers continued to breastfeed their babies considerably longer than urban mothers (graph 4.7).

Children's body size

There is no national information about the size of children aged less than two years or Aboriginal children aged two to four years. The only routinely-collected data about the size of newborn infants is the proportion who weigh less than 2,500 grams.

In 1998, the NT began collecting data in remote communities about the nutritional status of children aged under five years. Data about body size (height, weight and head circumference) and anaemia (haemoglobin levels) will be collected every six months.

Aboriginal children: Katherine region

In Aboriginal communities in the Katherine region, about 2,500 children were measured approximately 13,000 times between 1987 and 1996 to determine whether they were growing at the appropriate rate for their age. These measurements were done four times a year, and the prevalence of low weight was higher in the wet season than in the dry season. There was also some improvement during the ten-year period.

Up to the age of six months, the children's weight and length measurements were close to what would be expected in well-nourished children. After this age, the proportion of low weight-for-age measurements was three times greater than would be expected in well-nourished children. Their weight-for-height measurements were also low. This indicates two different types of growth faltering: faltering in length, leading to shortness, and faltering in weight gain itself. Faltering in length is important because it affects all bones, including the skull. Shortness is often overlooked as a problem because it is not obvious to the eye.

Adult body size and physical activity

The NHMRC linked increases in the body size of Australian men and women during the 1980s to decreases in their physical activity, concluding that the trend towards increasing levels of overweight and obesity was likely to be the result of small changes in people's eating and exercise habits (NHMRC 1997).

Adult body size

There is no information about the measured body size of non-Aboriginal adult Territorians.

NT Aboriginal adults

NT Aboriginal adults aged over 18 years were measured in the 1994 National Aboriginal and Torres Strait Islander Survey. One problem with interpreting these data is that many of the respondents declined to be measured, so it is not clear whether some of the differences in weight reflect differences in participation rather than size. The available information does not allow an assessment of whether the prevalence of overweight and obesity varies substantially with age.

In the Katherine region, where virtually everyone was measured, the 1994 National Aboriginal and Torres Strait Islander Survey found that 46% of Aboriginal adults were overweight or obese (table 4.8). This compares with the 1995 National Nutrition Survey figure of 55% for Australians (ABS & H&FS 1997).

4.8 NT Aboriginal adults and body size 1994

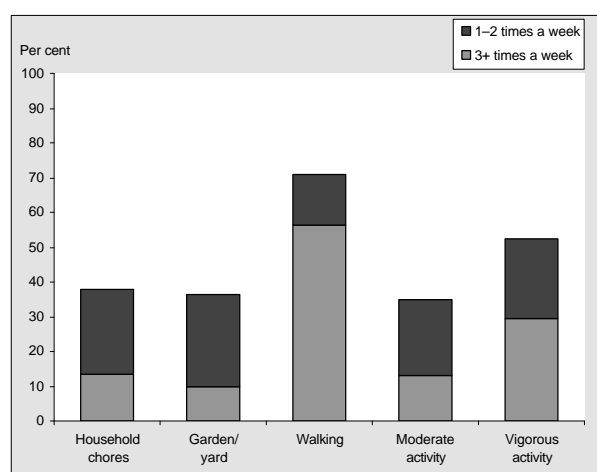
ATSIC Region	Number		Underweight	Per Cent		
	Surveyed	Measured		Acceptable weight	Overweight	Obese
Aputula	4,380	570	10.9	50.0	37.0	2.2
Alice Springs	2,420	1010	7.9	28.7	32.7	30.7
Tennant Creek	2,020	590	10.2	23.7	40.7	25.4
Katherine	3,860	3780	14.0	38.4	30.1	17.5
Nhulunbuy	3,650	2430	32.2	35.5	15.3	16.9
Jabiru	4,790	2600	18.5	39.8	34.0	7.7
Darwin	4,400	3220	8.4	28.6	33.5	29.5

Source: Adapted from ABS & ATSIC 1997

Physical activity

The University of New South Wales conducted a national study of participation in physical activity during November 1997. Although fewer than 200 people were surveyed in NT urban centres compared with more than 1200 people in Victoria and Queensland, Territorians were found to have similar patterns of physical activity to other Australians (Bauman 1998). This appears to contradict popular perceptions that Territorians participate more actively in physical and sporting activities.

4.9 NT physical activities 1997



Notes: 'Moderate activity' includes brisk walking or cycling
'Vigorous activity' means exercise at 70% to 85% of maximum heart rate

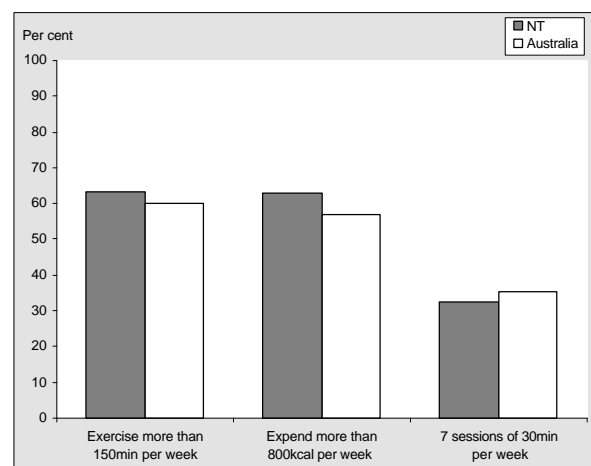
Source: Adapted from Bauman 1998

In 1997, walking was the physical activity most favoured by Territorians: each week, 56% walked three or more times, 15% walked once or twice and 29% did no walking (graph 4.9).

Three measures of sufficient physical activity to benefit health are:

- participation in more than 150 minutes per week, regardless of the number of sessions but only including walking, vigorous or moderate activity
- energy expenditure of around 800 kilocalories per week
- seven sessions of 30 minutes per week (recommended by the Commonwealth Department of Health and Aged Care)

4.10 NT sufficient physical activity 1997



Note: Participation in sufficient physical activity to benefit health

Source: Adapted from Bauman 1998

On measures of sufficient physical activity to obtain health benefits, Territorians had slightly higher participation rates than the national average in 1997 (graph 4.10). More Territorians achieved energy expenditure of around 800 kilocalories through walking, and vigorous and moderate physical activity than other Australians. However, when analysed by the number of daily sessions each week, only a third of Territorians were achieving the recommended seven sessions of 30 minutes exercise a week.

References

- ABS & ATSI 1997, *1994 National Aboriginal and Torres Strait Islander Survey: Social Atlas*, cat no 4155.0, ABS, Canberra.
- ABS & H&FS 1997, *National Nutrition Survey: Selected Highlights, Australia, 1995*, cat no 4802.0, ABS Canberra.
- Bauman A 1998 Comparisons of levels of physical activity participation and associated factors among Australian states (draft report for Active Australia), School of Community Medicine, University of NSW, Sydney.
- Cann 1995, Fruit and vegetable production from horticulture in the Northern Territory—Why don't we consume more of what we grow or produce more of what we consume? (background paper prepared for THS), Darwin.

- Cashel K & Jeffreson S 1995, *Core Food Groups: The Scientific Basis for Developing Nutrition Education Tools*, NHMRC, Canberra.
- d'Espaignet ET, Woods M & Measey ML 1997, *Northern Territory Midwives Collection: Mothers and Babies 1995*, THS, Darwin.
- Fejo L & Rae C 1996, *Evaluators Report: Strong Women, Strong Babies, Strong Culture Project 1992–1994*, HS&H and THS, Darwin.
- Gough S & McComb J 1997, *Food Consumption Patterns in Darwin October 1994*, Food & Nutrition Unit and Epidemiology Branch, THS, Darwin.
- Hughes RG 1995, The food and nutrition system in the Northern Territory (background paper prepared for THS), Darwin.
- Lee A 1992, Survival tucker: Aboriginal dietary intake and a successful community-based nutrition intervention project, thesis, University of Sydney, pp 71–90.
- Mackerras D 1998, *Evaluation of the Strong Women, Strong Babies, Strong Culture Program: Results for the Period 1990–1996 in Three Pilot Communities* occasional paper 2/98, Menzies School of Health Research, Darwin.
- Markey PG, d'Espaignet ET, Condon JR & Woods M 1998, *Trends in the Health of Mothers and Babies, Northern Territory, 1986-95*, THS, Darwin.
- NHMRC 1979, *Report of the 88th Session*, AGPS, Canberra.
- NHMRC 1997, *Acting on Australia's Weight: a Strategic Plan for the Prevention of Overweight and Obesity*, AGPS, Canberra.
- Rae C 1989, Maternal nutritional status among Aborigines in the Northern Territory: impact on birth weight, MPH thesis, University of Sydney.
- Rae C 1993, Breast feeding policy from 1994 to the year 2000 (draft 2), NTH&CS, Darwin.
- Sayers S & Powers J 1997, 'Risk factors for Aboriginal low birth weight, intrauterine growth retardation and preterm birth in the Darwin health region', *Australian & New Zealand Journal of Public Health*, vol 21, no 5, pp 524–30.
- Scholl TO, Hediger ML, Schall JI & others 1996, 'Dietary and serum folate: their influence on the outcome of pregnancy', *American Journal of Clinical Nutrition*, vol 63, no 4, pp 520–5.
- THS 1995, *Northern Territory Food and Nutrition Policy & Strategic Plan, 1995–2000*, Darwin.
- THS 1998, NT stores survey (unpublished), Food & Nutrition Unit, THS, Darwin.

Substance misuse

by Ian Crundall (Alcohol), Ruth Richards and Mary-Anne Measey (Tobacco), Joanne Townsend (Petrol), Michelle Trevena-Vernon (Kava) and Margaret Neill (Illicit drug use)

People engage in the use of alcohol, tobacco and other substances for a variety of reasons. Although use can offer positive and rewarding experiences, there are frequently negative outcomes for health and wellbeing. These outcomes not only affect the individual user but also impact on family, friends and the broader community.

Tobacco and alcohol have the greatest impact. About 15% of all deaths in Australia are attributed to cigarette smoking and 3% are directly caused by hazardous and harmful alcohol use. Alcohol accounts for 4.4% of hospital bed days and 5% are related to tobacco. Illicit drug use, on the other hand, accounts for 0.4% of all deaths in Australia and 0.3% of hospital bed days (English & others 1995). For the purpose of this chapter, substance misuse includes the use of illegal drugs and the inappropriate use of other substances.

As well as having various acute and chronic health effects, substance misuse is implicated in a range of social outcomes that include the breakdown of relationships, social disruption and lost productivity. These outcomes mean that substance misuse exacts significant levels of personal, social and economic costs.

The NT is exposed to a peculiar range of these costs and harms because of its patterns of substance misuse. While alcohol consumption and tobacco use are more widespread in the Territory, there are serious problems associated with petrol sniffing and use of kava in parts of the NT.

The nature of the Territory and the substance use choices of Territorians present different risks than occur in many other parts of the country. Like elsewhere, however, those risks take a toll on the health and welfare of the community.

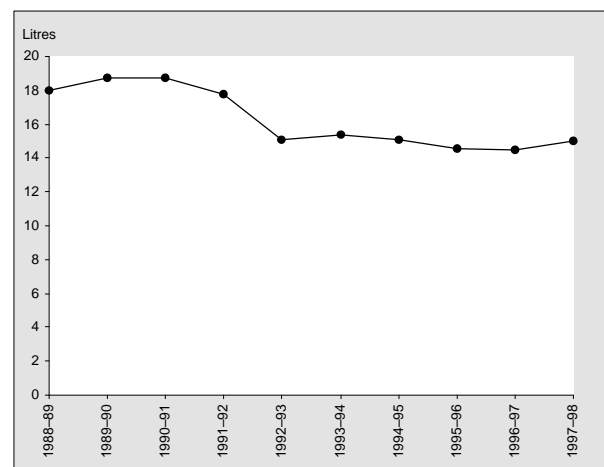
Alcohol

Alcohol has a strong history in the NT, dating back to pioneering days, and continues to be a mainstay in the life of most Territorians (Crundall 1994). While it is popular and offers many benefits, alcohol also extracts substantial costs from the Territory.

In 1990, alcohol-related harm cost the NT an estimated \$150 million in lost production, demands on health, welfare and correctional services, road accidents and law enforcement (Sessional Committee on the Use and Abuse of Alcohol by the Community 1991). This was nearly 5% of GDP—the value of all goods produced in the NT in a year—and two to three times higher than for the rest of the country. The NT government responded with a program dedicated to reducing alcohol-related harm. Introduced in April 1992, the Living With Alcohol program was funded through a liquor levy on liquor containing more than 3% alcohol by volume (Crundall 1995).

Drinking patterns

5.1 NT alcohol consumption



Note: Litres per person of pure alcohol drunk by all people in the NT, including visitors, each financial year

Data: Alcohol & Other Drugs Program, THS

The consumption of pure alcohol has fallen in the NT since 1988–89 (graph 5.1). Consumption averaged around 18.7 litres per person at the start of the 1990s.

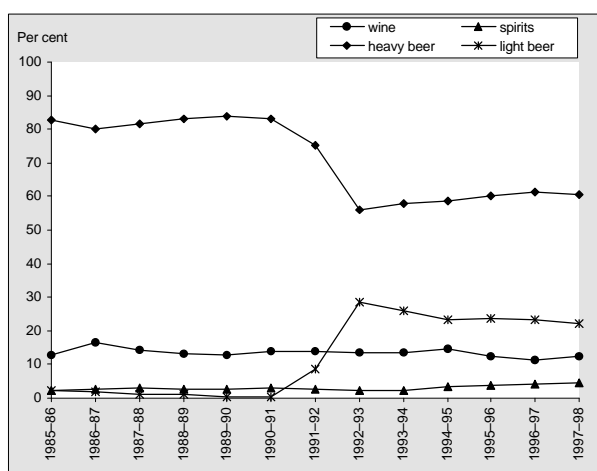
Measuring alcohol

Pure alcohol is used as a measure to account for the differing concentrations of various alcoholic drinks. Typically, light beer has less than 3% alcohol by volume; heavy beer around 4%; wine 12%; and spirits 40%.

It dropped 0.96 litres or just over 5% from 1990–91 to 1991–92; and 2.7 litres or 15% from 1991–92 to 1992–93. Despite a marginal increase in 1993–94, consumption dropped steadily from then until 1996–97 at an annual mean of 0.14 litres. There was a slight increase in 1997–98. From 1990–91 to 1997–98, there was an overall reduction of 3.7 litres or 20%.

A large part of this change has been because of an increased preference for low alcohol beverages—that is, drinks containing no more than 3% alcohol by volume.

5.2 NT market share alcoholic drinks



Data: Alcohol & Other Drugs Program, THS

At the same time as consumption of pure alcohol declined, there was a substantial increase in the market share held by low alcohol beer (graph 5.2). From 1992–93 to 1997–98, light beer averaged 29% of the total beer market compared with 1.5% for 1985–86 to 1990–91. This might be attributed to the April 1992 introduction of the liquor levy, which increased the price differential between light and heavy beer, and to the Living With Alcohol program, which made a concerted effort to promote light beer in order to reduce alcohol consumption. The marginal increase in 1991–92 might be partly explained by an

Measuring how much people drink: estimates and household surveys

Estimates per head of population provide standardised measures of community consumption, but they do not convey information about individual drinking patterns: some individuals will drink less than the mean, some will drink more and some will not drink at all. Household surveys are used to provide supplementary information about personal alcohol use.

expanded definition of light beer in 1992: from below 1.5% alcohol by volume to products containing no more than 3% alcohol by volume.

Apart from the change from heavy to light beer, the type of alcoholic drinks consumed in the Territory was fairly constant over the 13 years from 1985–86 to 1997–98: wine averaged 13.5% of the alcohol market, spirits 2.9% and beer 83.6%.

5.3 NT daily alcohol consumption

	Per Cent		
	Responsible	Hazardous	Harmful
Male			
1992	11	13	76
1997	33	17	50
Female			
1992	31	21	49
1997	34	33	33

Notes: Percentage of regular drinkers
Drinking levels assessed according to 1992 NHMRC guidelines (Pols & Hawks 1992)

Source: Bertram & Crundall 1997

Two household surveys, which assessed individuals' drinking levels according to 1992 NHMRC guidelines (table 5.3), found that, between 1992 and 1997 (Bertram & Crundall 1997):

- fewer males—a quarter less—drank at harmful levels, slightly more males drank at hazardous levels, and there was a threefold increase in responsible male drinkers
- fewer females—one-third less—drank at harmful levels, the number of females who drank responsibly remained almost unchanged, and there was a 57% increase in females who drank at hazardous levels

Thus, both males and females tended to come down from high levels of consumption rather than step up from low levels of consumption.

5.4 NT alcohol consumption

	Per Cent	
	NT Aboriginal	NT non-Aboriginal
No consumption	48	39
Responsible	27	46
Hazardous	16	9
Harmful	9	7

Notes: Percentage of urban Aboriginal and non-Aboriginal people
Drinking levels assessed according to 1992 NHMRC guidelines (Pols & Hawks 1992)

Source: Bertram & Crundall 1997

Bertram and Crundall (1997) contrasted the drinking patterns of urban Aboriginal and non-Aboriginal

people within the obtained sample. They found that Aboriginal people were less likely to drink, although a higher proportion drank at hazardous and harmful levels (table 5.4). This was consistent with an earlier survey conducted on Aboriginal communities in 1986–1987. Watson, Fleming and Alexander (1988) found that 59% of the Aboriginal people surveyed were nondrinkers, although this was more common among females (80%) than males. Of the drinkers, 80% of each gender drank at harmful or hazardous levels.

NT results from a 1994 national survey found that, of Aboriginal males surveyed, 42% had not drunk alcohol in the previous 12 months, 20% had drunk alcohol in the 12 months before the survey but not in the previous week, and 38% had drunk in the previous week. The figures for females were 69%, 12% and 19% respectively (ABS 1996). Collectively, this research indicates that Aboriginal males are more likely to drink than Aboriginal females.

The 1994 survey (ABS 1996) also found that 57% of NT Aboriginal people perceive alcohol as a major health problem, a concern that was greater in Darwin (72%) than in other urban centres (61%) or in rural areas (53%). Alcohol was identified as the leading substance use problem faced by Aboriginal people, being reported by 79% of those interviewed.

5.5 NT school students alcohol consumption

	Per Cent			
	Age of student			
	13 years	14 years	15 years	16 years
Male				
1984	31	29	45	51
1987	22	28	41	53
1990	18	20	32	45
1993	20	14	21	38
1996	25	18	27	38
Female				
1984	22	41	38	70
1987	35	33	41	50
1990	14	23	39	39
1993	9	20	32	33
1996	14	26	34	41

Note: Percentage of secondary school students who drank in the week before each survey

Source: Bertram & O'Reilly 1998

A series of secondary school surveys found that, in the NT, the extent of regular drinking in most age groups reduced over time (Bertram & O'Reilly 1998), although there was some increase between 1993 and 1996 (table 5.5).

In a study of people aged 16 to 24 years and no longer at school, 92% reported ever drinking alcohol and 63% reported drinking within the previous week. These recent drinkers comprised 71% of males and 57% of females, 51% of 16- to 17-year-olds, 64% of 18- to 20-year-olds and 70% of 21- to 24-year-olds (Crundall & Weir 1994).

Indicators of harm

People who experience alcohol-related health damage do not always seek treatment, so information from a range of sources is used to estimate the extent of alcohol-related harm in the community. These sources include hospitals, ambulance services, coronial reports, road accidents and prisons.

Hospital-based screening programs are useful because they access people who do not necessarily present with alcohol-related problems. However, because this method depends on people having a condition serious enough to put them in hospital, it may underestimate the extent of alcohol misuse in the community. Ambulance call-outs provide information about people who may not otherwise come to the attention of health services.

The impact of alcohol in terms of deaths and injuries can be gauged from coronial reports, which investigate all deaths not clearly the result of natural causes, and from road accidents in which alcohol played a part.

Treatment agencies

5.6 Clients seeking treatment for alcohol problem

	Per Cent			
	1994–95	1995–96	1996–97	1997–98
Darwin	46	48	50	56
Katherine	79	90	88	93
Tennant Creek	64	92	80	76
Alice Springs	64	57	43	45
NT total	53	54	53	57

Note: Percentage of clients registering alcohol as their principal drug problem at all NT specialist treatment centres

Data: Alcohol & Other Drugs Program, THS

Registration forms from the NT's specialist alcohol and other drug treatment agencies indicate that the majority of clients seeking treatment do so primarily because of alcohol (table 5.6). The differences between the four districts are a result, in part, of the wider range of services and expertise available in the larger centres, which tend to see a greater variety of drug problems.

5.7 Alcohol-related admissions Royal Darwin Hospital

	1992	1993	1994	1995	1996	1997
Alcoholic psychoses	79	82	60	91	89	97
Alcohol dependence syndrome	85	150	141	184	113	119
Non-dependent use of alcohol	165	214	281	610	760	630
Alcoholic cardiomyopathy	12	12	5	7	11	18
Excessive blood alcohol level	–	1	–	–	–	–
Alcoholic polyneuropathy	–	–	1	5	–	–
Alcoholic liver disease	76	73	48	86	98	85
Alcoholic gastritis	–	–	–	–	–	10
Toxic effect of alcohol	6	14	15	22	20	38
Total alcohol-related separations	423	546	551	1,025	1,091	997
Total separations	15,095	16,282	15,329	25,614	27,277	28,626
Percentage alcohol-related separations	2.8	3.4	3.6	4.0	4.0	3.5

Note: Alcohol-related separations (admissions) based on the illness being attributed entirely to alcohol use according to ICD-9

Data: Alcohol & Other Drugs, THS

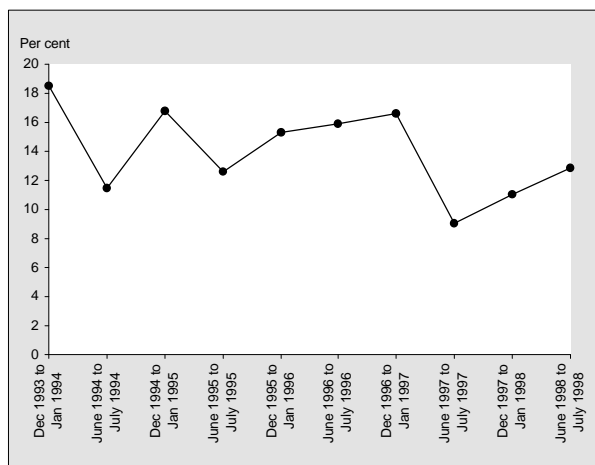
Hospital patients

Over the six years 1992 to 1997, 3.6% of all patients leaving Royal Darwin Hospital did so following hospitalisation for conditions attributed totally to alcohol (table 5.7). Most had been treated for either alcohol dependence or problems caused by non-dependent use of alcohol. These two categories accounted for 59% of all alcohol-related admissions (separations) in 1992, two-thirds in 1993, and between 75% and 80% over the next four years. These increases may have arisen from improved detection and referral systems, a greater willingness for people with alcohol-related illnesses to go into hospital or more people having alcohol-related illnesses.

Routine screening at Alice Springs Hospital over the five years to June 1998 identified an average of 34% of tested patients as being at risk from their alcohol consumption.

Accidents and deaths

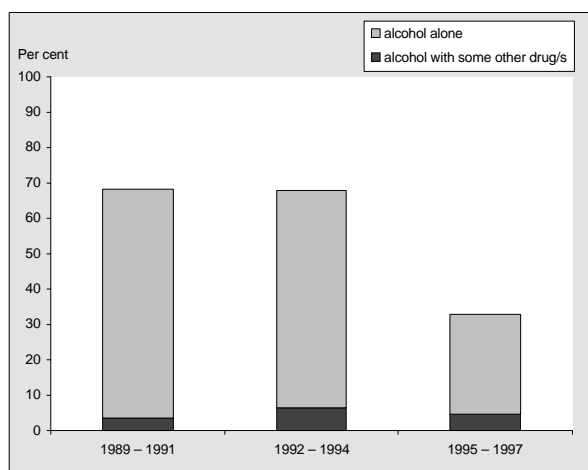
5.8 NT alcohol-related ambulance call-outs



Data: Alcohol & Other Drugs Program, THS

St John Ambulance collects data twice each year (during June and July, and again in December and January) and provides information about alcohol incidents that may not otherwise come to the attention of health services. According to data collected over the five years to July 1998, alcohol contributed to an average of 14% of ambulance call-outs (graph 5.8). The percentage of ambulance call-outs related to alcohol declined from an average of 15% over the period December 1993 to January 1996 to an average of 13% between June 1996 and July 1998.

5.9 NT coronial reports identifying the presence of alcohol



Note: 'Other drug/s' means other intoxicating substances, including licit and illicit drugs, and inhalants such as petrol

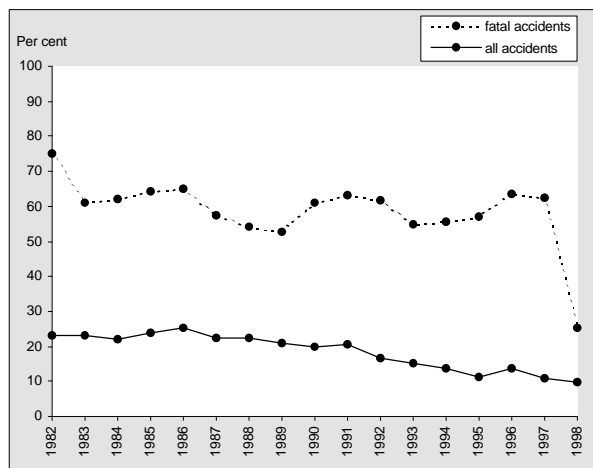
Data: Alcohol & Other Drugs Program, THS

The Alcohol & Other Drugs Program examined 1,447 NT coronial reports to find that, in the three years to the end of 1991, alcohol was present on its own in

65% of deaths and, together with some other drug, in another 3.4% of deaths (graph 5.9). For the years 1992 to 1994, the figures were 62% for alcohol alone and another 6.5% for alcohol with some other substance; for 1995 to 1997, they dropped to 29% and 4.5% respectively.

Road accident deaths and injuries

5.10 NT alcohol-related road accidents: fatal accidents and all accidents



Note: Some fatal accidents involve more than one death

Data: Alcohol & Other Drugs Program, THS

From 1982 to 1992 in the NT, there was a downwards trend in the extent to which alcohol was a factor in road accident deaths and road accidents generally (graph 5.10).

Between 1982 and 1992, most fatal road accidents (62%) in the NT were alcohol-related. Since 1992, this figure has dropped to 59%, with 1998 being the only year in which less than half were alcohol-related. Alcohol-related fatal accidents decreased by 21%, from an average of 34 per year for the years 1982 to 1992 to an average of 27 per year for the years 1993 to 1998. However, the total number of fatal accidents decreased by only 7%, from an average of 55 per year for the years 1982 to 1992 to an average of 51 per year for the years 1993 to 1998. Consequently, while there has been a small reduction in the number of fatal accidents on Territory roads, the contribution of alcohol to those accidents has diminished at a greater rate.

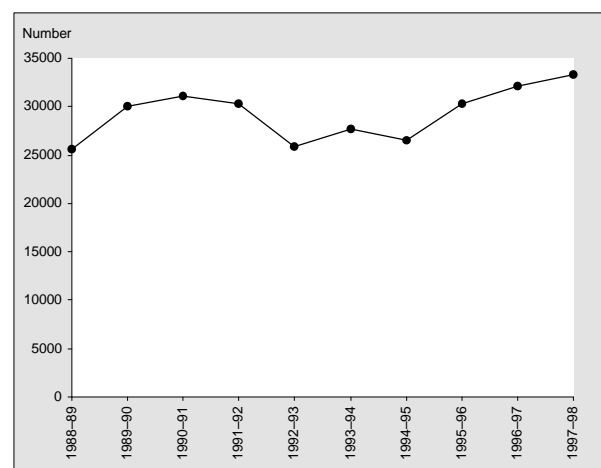
This trend of a decreasing contribution from alcohol is also evident across all road accidents. From 1982 to 1992, 22% of the NT's 21,605 road accidents were alcohol-related whereas only 12% were alcohol-related from 1993 to 1998. Alcohol was involved in 45% fewer road accidents, despite the average

number of road accidents increasing by 26% between the two periods 1982 to 1992 and 1993 to 1998.

Public drunkenness

Public drunkenness has not been a criminal offence in the NT since 1974. Under section 128 of the NT *Police Administration Act*, persons intoxicated in public are apprehended without arrest. They are not charged with an offence, but are either held in a police cell for a maximum of six hours or released to the accommodation and care of a sobering up shelter.

5.11 NT admissions to police cells and sobering up shelters



Notes: Apprehensions without arrest for public drunkenness (s. 128 *Police Administration Act*) and referrals from night patrols 1985-86 to 1991-92—not all sobering up shelters were operational for the full 12 months

Data: Alcohol & Other Drugs Program, THS

Although there have been fluctuations, there was a trend for increasing numbers of admissions to police cells and sobering up shelters during the ten years to 1998 (table 5.11). The highest numbers of admissions were recorded over 1996-97 and 1997-98. Differences in these data may be influenced by policing activities and the operations of night patrols rather than actual rates of public drunkenness.

Night patrols

Night patrols started on remote Aboriginal communities as a result of a perceived need to deal with the large number of drinkers on 'dry' communities and the social and family problems that arose from this.

from Mosey A 1994, *Night Patrols on Remote Aboriginal Communities in Central Australia 1991-1994*.

Arrests and summonses

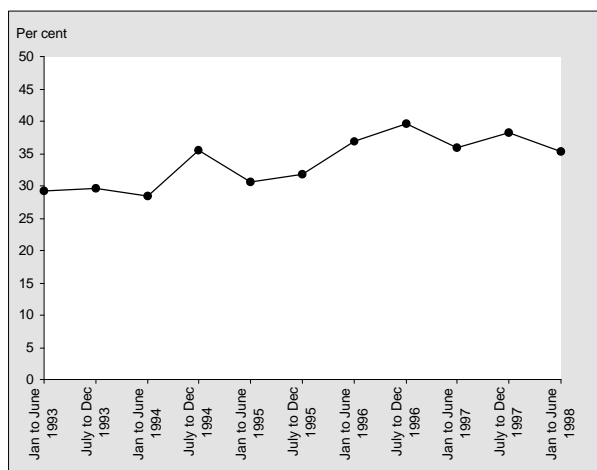
5.12 NT alcohol-related arrests and summonses

	Arrests and Summonses		
	Total	Alcohol-related	
		No.	%
Jan to June 1993	9,125	2,665	29.2
July to Dec 1993	9,576	2,839	29.7
Jan to June 1994	10,747	3,050	28.4
July to Dec 1994	9,543	3,386	35.5
Jan to June 1995	10,500	3,213	30.6
July to Dec 1995	10,790	3,422	31.7
Jan to June 1996	10,877	4,002	36.8
July to Dec 1996	10,321	4,089	39.6
Jan to June 1997	10,341	3,709	35.9
July to Dec 1997	9,919	3,789	38.2
Jan to June 1998	9,570	3,382	35.3

Data: Alcohol & Other Drugs Program, THS

The relationship between crime and alcohol misuse in the Territory is indicated by the extent of alcohol-related arrests and summonses (graph 5.13 and table 5.12). The five years to 1998 saw a trend towards a

5.13 NT alcohol-related arrests and summonses

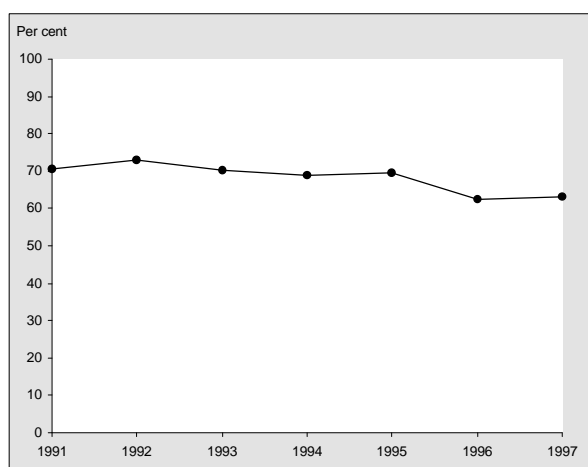


Data: Alcohol & Other Drugs Program, THS

greater proportion of alcohol-related arrests and summonses, although it should be noted that the earlier figures are likely to be conservative because of limitations in the recording system that operated at that time. These data may also be influenced by policing activities.

Prisons

5.14 NT alcohol-related prison receptions



Data: Alcohol & Other Drugs Program, THS

The percentage of alcohol-related prison receptions in the NT has declined over the seven years to 1997 (graph 5.14). Nevertheless, it remained a factor in the offending of six out of every ten prisoners.

Tobacco

Smoking tobacco is a leading cause of illness and death in Australia. It is a risk factor for many serious illnesses, including heart attack, stroke, lung and other cancers, and chronic respiratory disease. In order of importance, the most common causes of death from smoking in the NT between 1986 and 1995 were (Measey & others 1998):

- chronic obstructive pulmonary disease (emphysema)
- heart attack and related disease (ischaemic heart disease)
- lung cancer
- stroke
- pneumonia
- throat cancer (oropharyngeal cancer)

Who smokes?

Young people

Research indicates that the earlier people start to smoke, the longer and more heavily they are likely to smoke (AIHW 1995). Eighty per cent of all smokers

begin their addiction before they are 20 years old (Collins & Lapsley 1994).

A 1996 survey of NT school students found that, between 1993 and 1996, the percentage of recent smokers:

- increased in students aged 12 to 14 years
- remained the same in 15-year-olds
- decreased in 16- and 17-year-olds

Most 12-year-olds had never smoked (66% of males and 63% of females). Except for the high proportion of 17-year-old females (41%) who reported that they had never smoked, the percentage who had smoked recently increased with age. Most students obtained cigarettes from friends or got others to buy them, although older students also bought them from supermarkets, takeaway food shops and petrol stations. Preferred brands were Peter Jackson and Winfield (Bertram & O'Reilly 1998).

Adults

Despite a decline in NT smoking rates between 1990 and 1994, they continued to be higher than Australian rates. Richards and McComb (1996) analysed a 1994 survey of people aged 18 and over living in NT urban areas. They found:

- 35% were current smokers, 24% were ex-smokers, and 41% had never smoked
- 30% of women and 40% of men were current smokers
- of young people aged 18 to 24 years, 52% of men and 34% of women smoked cigarettes

By comparison, 23% of Australian women and 27% of Australian men were smokers in 1995 (Hill & others 1998).

Aboriginal people

Among NT Aboriginal people, the two leading causes of death and disability are heart disease and respiratory disease (Plant & others 1995). Smoking is recognised worldwide as a significant risk factor for these diseases.

The ABS (1996) reported that Aboriginal men smoke at a higher rate in the NT (59%) than Australia-wide (54%), but Aboriginal women smoke at a lower rate in the NT (36%) than Australia-wide (46%).

5.15 NT Aboriginal smokers

	Per Cent		
	Region		NT total
	Top End	Centre	
Male			
1986–1987	76.0	58.6	70.5
1994	62.0	46.0	59.4
Female			
1986–1987	53.6	9.0	42.6
1994	41.0	22.0	35.5
Total			
1986–1987	64.3	33.1	55.8
1994	52.9	34.4	47.3

Notes: 1986–1987—Percentage of people aged 15 and over who smoke (Watson & others 1988)
1994—Percentage of people aged 13 and over who smoke (ABS unpublished)

Data: Alcohol & Other Drugs Program, THS

Although NT Aboriginal smoking rates dropped between 1986–1987 and 1994, they were still very high for Aboriginal men generally and for Aboriginal people in the Top End compared with those in the Centre (table 5.15).

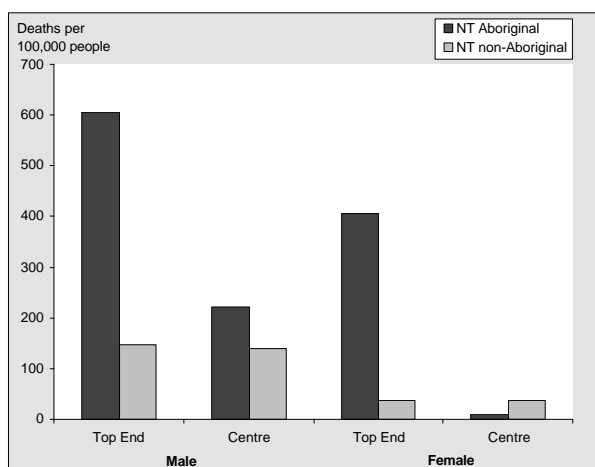
A survey conducted in 1986–87 found that, although smoking among Aboriginal women was very high in the Top End, chewing was practised by Aboriginal women and some older Aboriginal men in Central Australia. One quarter of the Aboriginal people interviewed chewed tobacco, and two-thirds of these lived in the Centre (Watson & others 1988).

The effects of smoking: death and illness

To understand the effects of the NT's high smoking rates, THS studied the health of NT people aged 15 years and older (Measey & others 1998). This study used an epidemiological technique (the aetiological fraction method) to estimate the numbers of deaths and hospital admissions caused by smoking between 1986 and 1995.

The researchers used information about admissions to NT public hospitals between 1993 and 1995 to calculate the number and rates of hospital admissions caused by smoking. Data from the NT's only private hospital were not available for this study.

5.16 NT smoking-related death rates 1986 to 1995



Notes: Age-adjusted death rates per 100,000 people aged 15 years and over, standardised to Australian 1991 population

Data: Measey & others 1998

5.17 NT smoking-related deaths 1986 to 1995

Region	Deaths					
	NT Aboriginal			NT non-Aboriginal		
	Total	Smoking-related No.	Smoking-related Rate	Total	Smoking-related No.	Smoking-related Rate
Male						
Top End	1,143	331	605	1,807	390	147
Centre	674	84	221	456	101	140
Total	1,817	415	457	2,263	491	145
Female						
Top End	936	240	407	715	80	38
Centre	475	5	9	203	24	38
Total	1,411	245	251	918	104	38
Total	3,228	660	—	3,181	595	—

Notes: Age-adjusted death rates per 100,000 people aged 15 years and over, standardised to Australian 1991 population

Source: Adapted from Measey & others 1998

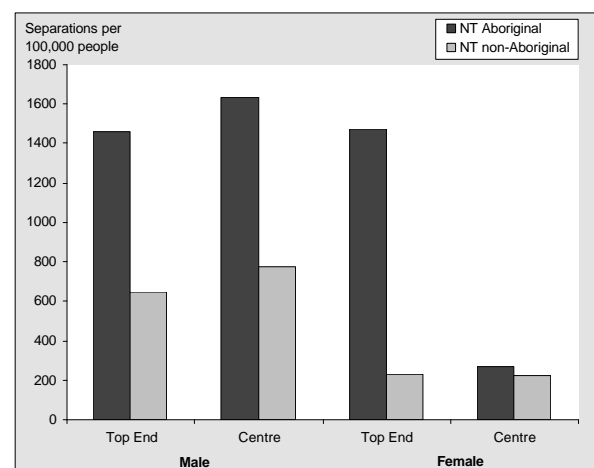
Of the 6,409 (3,228 Aboriginal and 3,181 non-Aboriginal) NT deaths of adults aged 15 years and over, cigarette smoking caused 1,255 (660 Aboriginal and 595 non-Aboriginal) or one in every five (20%) adult deaths in the NT between 1986 and 1995 (table 5.17).

The 1998 THS study found that the rates for smoking-related deaths were (graph 5.16):

- substantially higher for Aboriginal people than for non-Aboriginal people
- seven times higher for Aboriginal women than for non-Aboriginal women
- three times higher for Aboriginal men than for non-Aboriginal men
- higher for Aboriginal people in the Top End than in the Centre

The death rates from smoking-related causes were similar for non-Aboriginal people in both regions. For both Aboriginal and non-Aboriginal people, men were more likely to die from a smoking-related cause than were women (Measey & others 1998).

5.18 NT smoking-related hospital admissions 1993 to 1995



Note: Age-adjusted hospital admission rates per 100,000 people aged 15 years and over, standardised to Australian 1991 population

Data: Measey & others 1998

For illnesses caused by smoking, hospital admission rates were (graph 5.18):

- higher for Aboriginal people than for non-Aboriginal people
- slightly higher for Aboriginal males in the Centre than in the Top End
- substantially higher for Aboriginal females in the Top End than in the Centre

5.19 NT smoking-related hospital admissions 1993 to 1995

Region	Separations					
	NT Aboriginal			NT non-Aboriginal		
	Total	Smoking-related		Total	Smoking-related	
	No.	Rate		No.	Rate	
Male						
Top End	4,551	366	1,459	12,810	732	649
Centre	4,116	256	1,635	4,237	225	772
Total	8,667	622	1,520	17,047	957	672
Female						
Top End	8,861	376	1,472	16,197	211	230
Centre	6,906	61	270	6,082	72	222
Total	15,767	437	1,013	22,279	283	228
Total	24,434	1,059	—	39,326	1,240	—

Notes: Age-adjusted hospital admission rates per 100,000 people aged 15 years and over, standardised to Australian 1991 population

Source: Adapted from Measey & others 1998

Of the 63,760 adults (24,434 Aboriginal and 39,326 non-Aboriginal) aged 15 years and over admitted to NT hospitals from 1993 to 1995, 2,229 (1,059 Aboriginal and 1,240 non-Aboriginal) or 4% were admitted for illnesses caused by smoking (table 5.19).

The hospital admission rates for illnesses caused by smoking were highest for Aboriginal men, whose rate was more than twice that of non-Aboriginal men. More men than women were admitted to hospital because of smoking-related illnesses, and this was true for both Aboriginal and non-Aboriginal people. Aboriginal women were five times more likely to go into hospital with illnesses caused by smoking than were non-Aboriginal women (Measey & others 1998).

Passive smoking

Passive smoking is the inhalation of smoke from other people's cigarettes, cigars or pipes. Passive smoking has been associated with child ill health—SIDS, asthma and lower respiratory illness—and adult respiratory disease, cancer and cardiovascular disease.

In their analysis of a 1994 survey of people aged 18 years and over living in NT urban areas, Richards & McComb (1996) found:

- 30% reported feeling bad health effects from passive smoking
- 54% wanted enclosed public places to be totally smoke free, 22% wanted smoke-free areas in enclosed public places, 20% wanted no prohibition and 4% had no opinion
- of those who described themselves as smokers, one-third wanted public places to be totally smoke free, one-third wanted smoke-free areas in enclosed public places and one-third wanted no prohibition

A 1997 survey found that 42% of NT restaurant and cafe owners would support government legislation to make all restaurants and cafes totally smoke-free, 31% would not support this and 27% were unsure. In the same survey, 98% of NT doctors and 83% of NT lawyers said they would support legislation to introduce smoke-free areas in all Territory restaurants and cafes. Similarly, 94% of the general public was in favour of all restaurants and cafes providing smoke-free areas (Morrison & Gill 1997).

Legislation for smoke-free environments has been successfully introduced in Western Australia, the Australian Capital Territory and South Australia.

Petrol

Petrol sniffing is the most common form of inhalant substance misuse in the NT. It is practised predominantly by Aboriginal young people in larger remote communities. Petrol sniffing is the deliberate inhalation of petrol gas or fumes for its intoxicating effect.

Who sniffs petrol and other inhalants?

Petrol sniffing is a significant health and social problem. The 1994 National Aboriginal and Torres Strait Islander Survey found that 18% of Aboriginal people aged 13 to 24 years and 23% of people over the age of 25 years perceived petrol sniffing to be a problem in their local area (ABS 1996).

A 1997 THS survey found that approximately 200 young people were sniffing petrol and other inhalants—aerosol paint, glue—in at least ten remote

Central Australian communities and Alice Springs. This represents 1.5% of all non-Aboriginal and Aboriginal people aged eight years to 25 years who live in the area from Tennant Creek to the South Australia border. Separate figures for the percentage of Aboriginal young people were not available. Of the 200 young people surveyed, 140 were sniffing petrol on ten remote communities and 60, mainly sniffing paint, were in Alice Springs (Mosey 1997).

In 1997, six Top End communities were reported to have small numbers—up to eight in each community—of chronic sniffers, but no new recruits. Another four Top End communities experienced outbreaks of petrol sniffing involving 30 to 50 young people over the 1996–97 wet season. There is evidence that this pattern recurred the following wet season, with reports of 40 young people sniffing in one community in the Katherine region (Garrow 1997).

Health effects of petrol sniffing

Petrol contains a complex mix of toxins, including the hydrocarbons benzene, toluene and xylene. Tetraethyl lead is a common additive in leaded petrol. The effects of petrol sniffing are cumulative and problems are more likely to occur in long-term sniffers than in occasional or infrequent sniffers. Health effects may include: anorexia, vomiting, coughing, insomnia, abdominal pains, fitting, fatigue, headache, aggression, depression, irrationality, difficulty in concentrating, memory loss and hallucination, and weight loss (Mosey 1997; d'Abbs 1991; Brady 1995).

Organic lead can damage the brain, kidneys, liver and peripheral nerves. Exposure to either leaded or unleaded petrol can cause brain damage, although there is a tendency for this to occur less among those who sniff unleaded petrol (Gell 1995).

In the short term, the toxic effects of the volatile hydrocarbons in petrol depress the central nervous system and can cause a confused state, nausea, dizziness, hallucinations and impulsive, aggressive behaviour. Sudden sniffing death can occur if a petrol sniffer is startled or frightened in an intoxicated state, and accidental burns are common among petrol sniffers (Brady 1992).

In the long term, petrol sniffing can cause chronic tissue irritation throughout the respiratory system, tremors, sleep disorders, cardiovascular effects, blood abnormalities, and kidney and liver dysfunction (Gell 1995).

Brain damage as a result of petrol sniffing may lead to permanent disability, which poses particular problems for the families of disabled people, health services and the wider community. Disabled ex-sniffers are relatively young, have high support needs and very challenging behaviours. The cumulative effects of petrol sniffing may result in permanent disability in some users, requiring institutionalisation.

Some communities use unleaded petrol as a strategy to prevent the damage caused by the high lead content of leaded petrol. However, sniffing unleaded petrol still places people at risk of toxicity through exposure to hydrocarbons.

Avgas (aviation fuel) is widely used in parts of Central Australia and some Top End Aboriginal communities as a strategy to minimise petrol sniffing. This strategy is effective because sniffing avgas does not give the high that petrol does.

While intoxicated, petrol sniffers may take risks that result in their committing offences against both Aboriginal customary law and mainstream Australian law (Mosey 1997). Petrol sniffing not only affects the health of the user, but also has wider health, social and economic costs to families, the local community and wider society (Mosey 1997; Garrow 1997; d'Abbs 1991). These include increases in vandalism and other criminal damage within the community, family fighting and other aggressive behaviour.

The effects of petrol sniffing: death and illness

The Alcohol & Other Drugs program examined 1,447 coronial reports between 1989 and 1993 to find that petrol was present in 25 deaths, five of which involved both alcohol and petrol. This probably underestimates the number of deaths in which petrol sniffing was a contributing factor.

Petrol sniffing was a contributing factor in 44 admissions to Alice Springs Hospital between January 1992 and October 1997. The average length of stay for patients admitted with conditions directly related to petrol sniffing was:

- petrol-related burns—13 days
- lead toxicity—25 days
- seizures—13 days
- drug-induced psychosis—8 days

Kava

Kava is grown in the Pacific Islands and comes from the roots and lower part of the stem of the *Piper methysticum* plant. In Latin, *piper* means pepper and *methysticum* means a substance that causes intoxication or drunkenness (Lebot & others 1992). The dried root of the pepper plant is ground and mixed with water to produce a kava drink, which is the common method of consumption. Kava is described as a mild tranquilliser, sedative and anaesthetic, and is said to relieve anxiety and tension. Many of these properties depend on the amount of kava consumed.

Kava was first introduced into the NT in the early 1980s following a visit to Fiji by a group of Aboriginal people from eastern Arnhem Land. They thought it would be a better alternative to alcohol use and its associated social, economic and health problems. By the end of the mid 1980s, kava was widely used in eastern and western Arnhem Land communities. Kava use has remained confined mainly to this region.

Despite differing opinions as to whether kava use has been positive or negative for these Aboriginal communities, the majority recognise that heavy kava use leads to economic, social and health problems. Supporters of kava consider the effects to be less damaging than those of alcohol or petrol sniffing—for example, domestic violence, vandalism and other community disruption.

Who uses kava?

There is limited research into kava use. In 1986, Watson, Fleming and Alexander (1988) identified the following patterns of kava use in communities in eastern and western Arnhem Land:

- 25%, or one in every four people, drank kava
- 40% of men and 10% of women drank kava
- people over sixty were less likely to drink kava—that is, only 20%
- 70% of people drank kava at least once a week, with approximately 20% reported as drinking daily

The 1993 d'Abbs report found that, between January and July 1986, 998 kg of kava was sold in eastern Arnhem Land. By 1992, this had increased almost 14-fold, with 14,383 kg being sold. d'Abbs found that, in 1992, in kava-using communities:

- 70% of men drank kava

- 30% of women drank kava
- men tended to drink more often than women and drank more at each drinking session

Anecdotal evidence suggests that the prevalence of kava consumption has increased in the NT since the mid 1990s.

The health effects of kava

Knowledge of the health effects of heavy or prolonged kava use is limited due to the paucity of research and clinical studies. From available information, we know that occasional kava users are unlikely to experience problems if they stop using kava. In fact, their general health will probably improve if kava is not replaced with alcohol, petrol and/or other drugs (Lebot & others 1992).

The intoxicating effects of kava drinking depend on the amount of kava consumed (Neill & Davies 1998a). Kava causes sedation, leading to a sense of unreality and fatigue. Acute effects of kava drinking are:

- initial numbing of the mouth, which diminishes once kava use ceases
- initial euphoric feelings with mild alteration of senses
- the possibility of mild sedation and a sense of muscle weakness (being unsteady on one's feet)

Heavy and/or regular kava users are more likely to report generalised ill health and may suffer from malnutrition and weight loss (Mathews & others 1998). This results directly from the kava inducing nausea, loss of appetite and poor absorption of nutrients and, indirectly, through a lack of time and money to eat properly (Alexander & others 1987).

Other illnesses thought to be associated with heavy and/or regular kava use are a greater propensity for infections, heart problems, kidney and liver problems, and skin problems (Norton & Ruze 1994; Spillane & others 1997) but further confirmation is required by more research. On the basis of available evidence, Watson, Fleming and Alexander (1988) recommend that kava should not be used:

- with alcohol or other drugs
- by pregnant or breastfeeding women
- by people with liver, heart, asthma or diabetes problems
- by people on medication

The Alcohol & Other Drugs Program analysed 1,447 NT coronial reports to find that between 1989 and 1997 kava was present in seven deaths, all before 1995. In five of those cases, kava was the only substance identified; the other two also included alcohol. The exact contribution of kava to these deaths requires further analysis.

Kava and the law

There has been increasing concern in the NT regarding the social, economic and health effects of kava use on some Aboriginal communities in Arnhem Land. After community consultation with eight major kava-using communities, and discussion and debate in the NT Legislative Assembly, the *Kava Management Act* became law in May 1998. This legislation aimed to control the escalating problems associated with kava use by regulating the kava trade, initially through a total ban on production, possession and supply without a licence, and its possible reintroduction at a later date via a licensing system.

The NT government put in place a monitoring system in May 1998 to track the impact of the kava ban. In the three months following enforcement of the *Kava Management Act*, most communities noticed a general improvement in the health of individuals and community wellbeing. Early indications of positive consequences included higher levels of disposable income, an increase in traditional and cultural activities—for example, fishing and hunting—and greater productivity within communities. Many communities considered the ban had given both drinkers and nondrinkers a break from kava, and that it had provided communities with a chance to take control over kava and make choices for themselves about the extent of its use.

Illicit drug use

Illicit drug use refers to the misuse of legal drugs, which includes prescription drugs diverted to the black market, and the use of illegal drugs such as cannabis and heroin. Illicit drug use is a concern for public health programs because it causes significant harm to community health and wellbeing.

Indicators of use

Because of the illegal nature of the activity, details of illicit drug use are not readily available. Access to information is also problematic because of the transient lifestyle of many of those who use drugs illegally in the Territory. These considerations necessarily qualify conclusions about the extent and character of illicit drug use.

Nevertheless, the extent of illicit drug use in the community may be gauged using data from a number of sources: drug treatment agencies, the Darwin-based needle exchange service, coronial reports and information collected about users who come into contact with the criminal justice system.

Treatment agencies

Information from NT drug treatment agencies indicates that opiates and cannabis were most often the reason for clients being admitted to treatment for drug use in the three years to 1998 (table 5.20).

5.20 Clients seeking drug treatment

Drug	1996	1997	1998
Amphetamines	26	41	62
Barbiturates	1	2	2
Benzodiazepines	25	18	32
Tranquillisers	3	1	3
Cannabis	117	159	194
Cocaine	2	2	1
Hallucinogens	1	4	3
Opiates	110	148	257
Antidepressants	6	4	4
Ecstasy	0	1	0
Minor analgesics	0	1	2
Polydrug use	81	129	178

Note: Number of clients admitted to NT drug treatment programs

Data: Alcohol & Other Drugs Program, THS

Almost as common was polydrug use, involving a combination of drugs, followed by amphetamines and benzodiazepines. The number of clients presenting with illicit drug problems more than doubled over these three years, from 372 in 1996 to 738 in 1998.

Common names of drugs used illicitly

Cannabis

gunja, mull, smoko, smoking dope, dope, pot, hydro (hydroponically grown), skunk (special strain)

Amphetamines

speed, crystal, goey, meth, uppers—ecstasy is known as E, XTC and eccies

Heroin

H, heroin, smack, hammer, slow, dope

Schedule 8 drugs

MS or morph (morphine); greys, oranges and purples (according to strength), 'done (methadone)

Benzodiazepines

Vs (Valium), rohhies (Rohypnol), seres (Serepax), moggies (Mogadon)

Needle exchange service

5.21 Injectable drug use

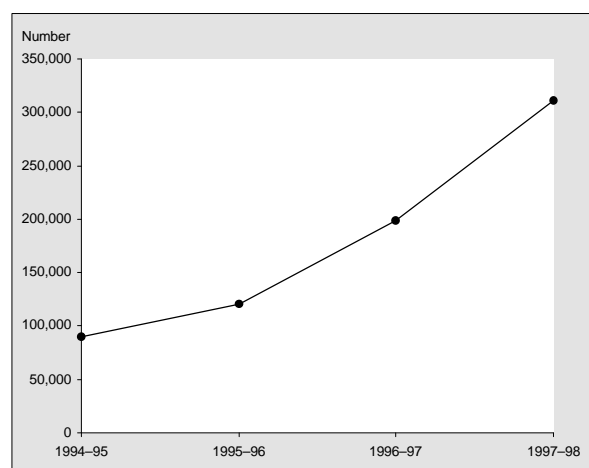
Drug	Male	Female	Total	
			No.	%
Heroin	2	1	3	2.3
Methadone	1	3	4	3.1
Morphine	79	17	96	74.4
Ritalin	1	0	1	0.8
Amphetamines	15	4	19	14.7
Steroids	2	1	3	2.3
Temazepam	0	1	1	0.8
Valium	0	1	1	0.8
No answer	1	0	1	0.8
Total	101	28	129	100.0

Notes: Client reports of most recent injectable drug use
NT AIDS Council's Needle Exchange Service survey

Source: Roberts 1998

The data from NT drug treatment agencies (table 5.20) contrast with that collected by the NT AIDS Council in an October 1998 survey of injecting drug users who accessed the Darwin-based Needle Exchange Service (Roberts 1998). The Needle Exchange Service provides clean injecting equipment for injecting drug users and safe disposal of injecting equipment. In the 1998 survey (table 5.21), opiates were named most often by clients reporting the drug they had used most recently. Morphine accounted for 75% of reports; amphetamines were second (15%).

5.22 Syringes dispensed



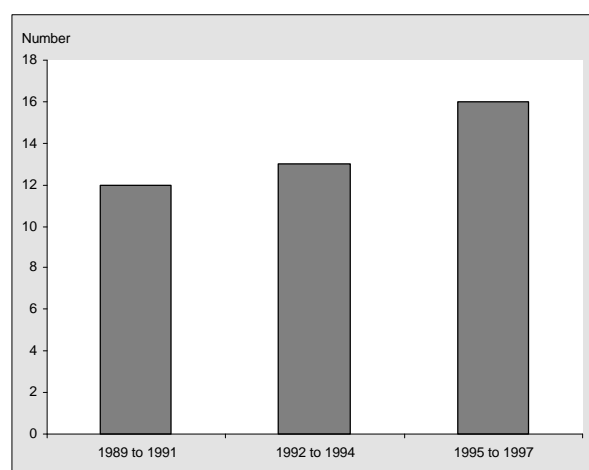
Note: 1997-98 is annualised based on data for 1 July 1997 to 31 May 1998

Data: NT AIDS Council's Needle Exchange Service

The number of syringes distributed through the Darwin-based NT Aids Council is expanding. There was a 120% increase in the number of syringes distributed between 1994-95 and 1996-97, a trend that continued between July 1997 and May 1998 when 284,741 needles were distributed, almost 100,000 more than the previous year (graph 5.22). In 1997-98, the NT AIDS Council dispensed syringes to 1,658 individuals in Darwin.

Deaths

5.23 NT coronial reports identifying the presence of illicit drugs



Note: One or more illicit drugs implicated in NT coronial reports, 1989 to 1997

Data: Alcohol & Other Drugs Program, THS

Deaths associated with illicit drug use are partly reflected in the number of coronial reports that mention at least one illicit drug. Between 1989 and 1997, 73%

of coronial reports indicated the presence of more than one substance. Most of these substances were legal—for example, alcohol or prescription drugs. Relatively few deaths were associated with the presence of illicit drugs over this period (graph 5.23). Illicit drugs were associated with 4.6% of all drug-related deaths reported and 2.8% of all the deaths identified from the coronial reports examined.

Arrests and summonses

5.24 NT drug-related arrests and summonses



Data: Alcohol & Other Drugs Program, THS

In the three years to 1997–98, the number of arrests and summonses for drug-related matters decreased by 40% (graph 5.24). Moreover, these matters were a smaller proportion of all arrests and summonses: 4.6% in 1995–96, 3.8% in 1996–97 and 3.1% in 1997–98. In considering these data, it must be noted that changes over time might reflect policing practices rather than usage patterns.

Prisons

The number of prison receptions for either possessing or using drugs is a small percentage of all people put in prison. These matters accounted for only 2.8% of prison receptions in 1995, 0.7% in 1996 and 2.2% in 1997.

Health risks

Illicit drug use is accompanied by health risks. Some risks are specific to particular drugs; others are associated with the method of use or manufacture.

Overdose and poisoning are risks with all illicit drug use: there are no controls over the strength, purity and hygiene of illegally-manufactured drugs; and prescription drugs diverted to the black market were intended to be taken under medical supervision to avoid these risks.

Using drugs intravenously (injecting them) has additional health risks. Users who share needles risk infection from diseases carried by blood—for example, HIV, hepatitis B and hepatitis C. The injection of medications intended to be taken orally (by mouth) has particular problems because these drugs were not designed to be delivered into a vein. Abscesses can form at the injection site as a result of chemical toxicity.

Heroin and other opiates

Heroin is one of a group of drugs known as opiates (sometimes called narcotic analgesics), which also include morphine, codeine, pethidine and methadone.

Usually injected, heroin causes a rush of intense pleasure and a strong feeling of wellbeing. Although it is not very toxic to the body, heroin is highly addictive. As well as the risks associated with injecting drug use (see above), heroin users risk infection and overdose because the drug's illegal manufacture means its purity and strength are unpredictable.

From 1979 to 1995 in the NT, opiate dependency and poisoning were known to have caused 12 deaths, four of which were identified as opiate overdoses.

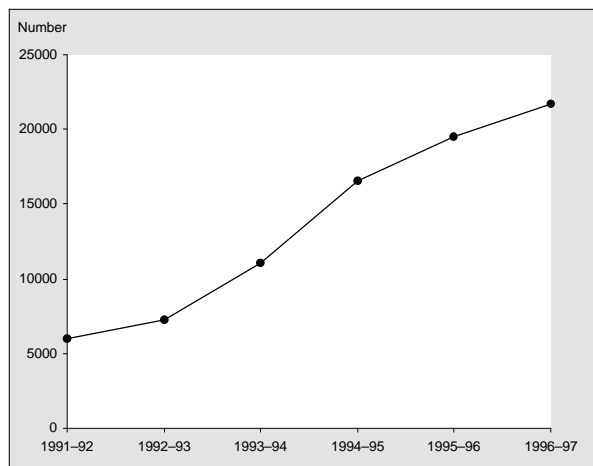
Schedule 8 drugs

Drugs listed under Schedule 8 of the *Poisons and Dangerous Drugs Act* are intended to manage pain, and a careful balance needs to be maintained between pain relief and dependence. They may only be prescribed by doctors. Schedule 8 drugs include codeine phosphate, detromoramide, fentanyl, methadone, oxycodone, pentazocine and pethidine.

Over the six years from 1991–92 to 1996–97, the volume of Schedule 8 prescriptions in the NT increased by a factor of about four (graph 5.25).

These data are consistent with reports of the increased diversion of Schedule 8 medications to the illegal market in the NT and their use intravenously, often in

5.25 NT Schedule 8 drug prescriptions



Data: Alcohol & Other Drugs Program, THS

the form of a polydrug cocktail. This behaviour is then associated with all the risks of injecting drug use (see opposite).

Benzodiazepines

Benzodiazepines belong to a group of prescription drugs classified as sedatives under Schedule 4 of the *Poisons and Dangerous Drugs Act*. The most commonly prescribed psychoactive (mood or mind altering drugs) in Australia, doctors prescribe benzodiazepines to treat severe anxiety and sleeping problems. They relax muscles, and affect the central nervous system by slowing down physical, mental and emotional responses.

People who inject drugs meant to be taken orally tend to misuse benzodiazepines. Often they are used to supplement or control other illicit drug problems, as they can lessen the effects of withdrawal or increase the effects of other drugs. Anecdotal reports from agencies dealing with illicit drug users suggests that this practice is widespread in the NT.

Health problems include issues related to needle use (see opposite). Side effects of benzodiazepine misuse include drowsiness, lethargy, confusion, euphoria, mood swings, headaches, nausea, dizziness and slurred speech. Tolerance to the drug occurs quickly, usually after three to fourteen days (CEIDA 1988). Addiction to the drug is common in long-term use, and giving it up abruptly causes symptoms of withdrawal.

Ecstasy and other amphetamines

Ecstasy is one of the most popular amphetamines, a group of drugs which are mainly used by young people as part of the nightclub scene.

In Australia, amphetamines are the most widely used illicit drug after marijuana—in fact, from 1988 to 1992, amphetamine use increased by one-third in the general community and almost doubled among 14- to 24-year-olds (ABCI 1997). Anecdotal reports from drug agencies suggest that amphetamines are common among illicit drug users in the NT, especially occasional, recreational users.

Recent research points to considerable psychological dangers associated with the use of amphetamines (ADF 1997).

Amphetamines enhance the user's mood and increase attentiveness and vigilance. Continued use can lead to psychological problems, mood swings, and poor recall and attention. Long-term use can lead to malnutrition, reduced resistance to infection, violence, emotional disturbance and psychosis. There has been an increase in the variety of amphetamine derivatives in Australia and this trend will probably continue (ABCI 1997).

When amphetamines are used intravenously, as they often are, users are exposed to the health risks of injecting drug use (see opposite).

Ecstasy, which is taken in tablet form, is similar in composition and effect to both amphetamines and hallucinogens. Drug agencies report that its use and availability appears to be increasing in the NT. Because ecstasy is manufactured illegally, there are no controls over strength and hygiene. This means that users risk overdose and poisoning, as well as the following particular health risks (ADF 1997):

- heart attack or brain haemorrhage from the stimulant effect
- overheating—the combination of ecstasy with prolonged and vigorous dancing in hot, humid venues, such as rave or dance parties, raises the body temperature to dangerous levels (hyperthermia)
- overdrinking—it is important to drink water but several people have died from drinking large quantities all at once, causing the brain to literally drown from the excess fluid intake (dilutional hyponatremia)

Cannabis

Although 1996 amendments to the NT *Misuse of Drugs Act* made it a discretionary offence for people aged 17 years and older to possess limited amounts of cannabis, it has always been illegal for younger people.

A 1994 national telephone survey using weighted samples found the NT had the highest level of personal cannabis use in Australia. More than half the respondents (55%) reported ever using cannabis and another 16% reported having used cannabis within the previous month (Bowman & Sanson-Fisher 1994).

A 1996 survey of secondary school students highlighted widespread use of cannabis among young people in the NT (Bertram & O'Reilly 1998).

5.26 NT school students' cannabis use

School Year	Per Cent			
	Never	Recency of use		
		4 weeks or more	1 to 4 weeks	less than 1 week
Male				
7	82	6	7	5
8	68	13	7	12
9	57	24	8	11
10	49	21	10	20
11	49	20	16	15
12	17	25	8	50
Female				
7	82	10	4	4
8	74	13	1	12
9	65	14	5	16
10	52	16	9	13
11	42	27	7	24
12	32	32	26	10

Note: Percentage of secondary school students who had used cannabis

Source: Bertram & O'Reilly 1998

The data show increasing levels of use at the higher Year Levels (table 5.26). Less than 20% of Year 7 students reported having used cannabis, compared with more than two-thirds of Year 12 students. The general tendency was for use to be more common and more regular among males.

Crundall and Weir (1994) also found a gender difference in a street intercept study of young Territorians aged 16 to 24 years and no longer

attending school: 68% of males compared with 45% of females had used cannabis in the previous six months.

In 1994, 21% of NT Aboriginal people listed marijuana as a local problem, a concern that was more common in urban areas (45%) than in rural areas (13%) (ABS 1996). More recent anecdotal reports from a range of sources indicate that, in remote Aboriginal communities, more people are using cannabis and they tend to be heavy users: a particular concern given that heart disease and respiratory disease are the two leading causes of death and disability among Aboriginal people.

Long-term cannabis smoking causes a range of respiratory problems because of the high tar content of cannabis. Cannabis smokers increase their risk substantially when they combine it with cigarette smoking. Other health risks associated with cannabis use include (Bleeker & Malcolm 1998):

- smaller and lighter babies born to women who use cannabis in pregnancy—use during pregnancy has an increased risk of premature birth and low birthweight, which places the newborn at risk of breathing problems and infections
- reduced concentration, memory and the ability to learn—regular cannabis use can have this effect
- lower sex drive, irregular menstrual cycles and lowered sperm counts—experienced in some cannabis users
- psychosis—heavy and long-term use in vulnerable people can cause a syndrome similar to schizophrenia, the symptoms of which include anxiety or panic, hallucinations, confusion and feelings of excitement.

References

- ABCI 1997, *Australian Illicit Drug Report 1996–97*, Canberra.
- ABS 1996, *National Aboriginal and Torres Strait Islander Survey Northern Territory*, cat no 4190.7, AGPS, Canberra.
- ADF 1995, *How Drugs Affect You—Cannabis* (pamphlet), Melbourne.
- ADF 1997, *How Drugs Affect You—Ecstasy* (pamphlet), Melbourne.
- AIHW 1995, *Submission (No 71) to the Senate Committee on the Tobacco Industry and the Costs of Tobacco-Related Illness*, Report of the Senate Community Affairs References Committee, Senate Printing Unit, Canberra.

- Alexander K 1985, *Kava in the North: A Study of Kava in Arnhem Land Aboriginal Communities*, ANU NARU, Darwin.
- Alexander K, Watson C & Fleming J 1987, *Kava in the North: a research report on Current Patterns of Kava use in Arnhem Land Aboriginal communities* (monograph), ANU NARU, Darwin.
- Bertram S & Crundall I 1997, *Summary of Household Survey of Alcohol Consumption and Related Attitudes February–March 1997*, Alcohol & Other Drugs Program, THS, Darwin.
- Bertram S & O'Reilly B 1998, *Summary of the 1996 Australian Secondary School Alcohol and Drug Survey Northern Territory Findings*, Alcohol & Other Drugs Program, THS, Darwin.
- Bleeker A & Malcolm A 1998, *Mulling it Over: Health Information for People Who Use Cannabis* (booklet), Manly Drug Education and Counselling Centre, Sydney.
- Bowman J & Sanson-Fisher RW 1994, *Public Perceptions of Cannabis Legislation*, National Drug Strategy monograph 28, AGPS, Canberra.
- Brady M 1992, *Heavy Metal: The Social Meaning of Petrol Sniffing in Australia*, Aboriginal Studies Press, Canberra.
- Brady M 1995, 'An overview of the prevalence of petrol sniffing and related mortality', in *Workshop on Lead and Hydrocarbon Toxicity from Chronic Petrol Inhalation*, eds Brady M & Torzillo P, AGPS, Canberra.
- CEIDA 1988, *Minor Tranquillisers: Depressant*, Sydney.
- Collins DJ & Lapsley HM 1994, *The Economic Costs Generated by Tobacco Use in Australia*, HS&H Submission to the Industry Commission Inquiry into the Tobacco Growing and Manufacturing Industries, HS&H, Canberra.
- Crundall I & Weir S 1994, *Alcohol and Young People in the Northern Territory*, Alcohol & Other Drugs Program, NTH&CS, Darwin.
- Crundall I 1994, 'Living with Alcohol in the Northern Territory', *Health Promotion Journal of Australia*, vol 4, no 1, pp 52–3.
- Crundall I 1995, 'The NT Living With Alcohol Program: Climbing through a window of opportunity' in *Dealing with Drugs: Ethics, Economics and Efficiency*, Qld Alcohol and Drug Foundation, Brisbane, pp 98–105.
- d'Abbs P 1991, The prevention of petrol sniffing in Aboriginal communities: a review of interventions (unpublished report), Drug and Alcohol Bureau, NTH&CS, Darwin.
- d'Abbs P 1993, *A Review of Kava Control Measures in the Northern Territory*, Menzies School of Health Research, Darwin.
- DrugLinks web site: <http://www.ceida.net.au>
- English DR, Holman CDJ, Milne E and others 1995, *The Quantification of Drug Caused Morbidity and Mortality in Australia*, 2 vols, AGPS, Canberra.
- Garrow A 1997, *Time to Stop Reinventing the Wheel—Petrol Sniffing in the Top End*, Alcohol & Other Drugs Program, THS, Darwin.
- Gell K 1995, 'Medical problems of petrol sniffers on communities', in *Workshop on Lead and Hydrocarbon Toxicity from Chronic Petrol Inhalation*, eds Brady M & Torzillo, AGPS, Canberra.
- Hill DJ, White VM & Scollo MM 1998, 'Smoking behaviours of Australian adults in 1995: trends and concerns', *Medical Journal of Australia*, vol 2, no 168, pp 204–5.
- Lemmings CH, Harris J & Lennings R 1996, *Evaluation of Banyan House: a Review of Treatment Services for Drug Abuse in the Northern Territory*, Brisbane North Alcohol and Drug Service, Brisbane.
- McKay I 1995, *Kava: An Information Paper*, National Food Authority, Canberra.
- Mathews JD, Riley MD, Fejo L and others 1988, 'Effects of the heavy usage of kava on physical health: summary of a pilot survey in an Aboriginal community', *Medical Journal of Australia*, vol 148, no 11, pp 548–55.
- Measey ML, d'Espaignet ET & Cunningham J 1998, *Adult Morbidity and Mortality due to Tobacco Smoking in the Northern Territory 1986–1995*, THS, Darwin.
- Morrison M & Gill J 1997, Northern Territory clean air restaurant campaign (unpublished report), THS, Darwin.
- Mosey A 1994, *Night Patrols on Remote Aboriginal Communities in Central Australia 1991–1994*, Drug and Alcohol Services Association, Alice Springs.
- Mosey A 1997, *Report on Petrol Sniffing in Central Australia*, Alcohol & Other Drugs Program, THS, Darwin.
- Neill M & Davies J 1998a, *Kava Health Information* (pamphlet), THS, Darwin.
- Neill M & Davies J 1998b, *Immediate Health Aspects of Reduced Kava Intake* (pamphlet), THS, Darwin.
- NHMRC 1997, *The Health Effects of Passive Smoking: a Scientific Information Paper*, NHMRC, Canberra.
- Norton S & Ruze P 1994, 'Kava dermopathy', *Journal of the American Academy of Dermatology*, vol 31, no 1, pp 89–97.
- Plant AJ, Condon JR & Durling G 1995, *Northern Territory Health Outcomes: Morbidity and Mortality 1979–1991*, NTH&CS, Darwin.
- Pols RG & Hawks DV 1992, *Is there a Safe Level of Daily Consumption of Alcohol for Men and Women?* AGPS, Canberra.

- Prescott J & McCall G (eds) 1988, *Kava: Use and Abuse in Australia and the South Pacific*, University of New South Wales, Sydney.
- Quit Victoria web site: <http://www.peg.ap.org/~vshp>
- Richards R & McComb J 1996, *Tobacco Consumption in Darwin, October 1994*, Alcohol & Other Drugs Program, THS, Darwin.
- Roberts C 1998, *Snapshots II—The Dry: Characteristics of Needle Exchange Clients During the 1998 Dry*, NT AIDS Council, Darwin.
- Sessional Committee on the Use and Abuse of Alcohol by the Community 1991, *Measures for Reducing Alcohol Use and Abuse in the Northern Territory*, LANT, Darwin.
- Spillane PK, Fisher DA & Currie BJ 1997, Neurological manifestations of kava intoxication (letter), *Medical Journal of Australia*, vol 167, no 3, pp 172–3.
- Tobacco Control web site:
<http://www.health.usyd.edu.au/tobacco>
- Watson C, Fleming J & Alexander K 1988, *A Survey of Drug Use Patterns in Northern Territory Aboriginal Communities 1986–1987*, Alcohol & Other Drugs Program, NTH&CS, Darwin.
- Winstanley M, Woodward S & Walker N 1995, *Tobacco in Australia—Facts and Issues*, Victorian Smoking and Health Program (QUIT Victoria), Melbourne.

Specific health issues

Mental health

by Tricia Nagel

This chapter discusses mental health services, including responses to particular problems that affect Territorians' mental health, and presents recent hospitalisation and deaths data that provide an insight into mental illness in the NT.

Although the disabling effects of mental illness to the individual and their immediate family are well known, the extent to which mental illness impacts on society is now also being recognised. The World Health Organisation estimated in 1990 that five of the ten leading causes of disability worldwide were psychiatric conditions, which are expected to increase their share of the global disease burden from 10.5% to almost 15% in 2020 (Murray & Lopez 1996). A 1997 Australian survey of mental health and wellbeing suggested a large unmet need for mental health services: it found that, although almost 20% of adults had suffered a mental disorder in the previous year, only 38% of these adults had received treatment from the health system (ABS 1998c).

Mental health services

Comprehensive specialist mental health services have been located in the NT only since the 1980s. Currently, the Territory's general and forensic psychiatry services are based in the two largest urban centres, Darwin and Alice Springs, where seven full-time psychiatrists are employed in public mental health services. Darwin also has a specialist child and adolescent mental health service, two full-time psychiatrists in private practice and occasional visits from interstate specialists. The NT's psychiatric inpatient facilities comprise 23 beds in Darwin and six beds in Alice Springs. Although there are no dedicated private psychiatric inpatient beds in the NT, private patients can be admitted to Darwin Private Hospital.

Community-based mental health services are located in the NT's five urban centres, which provide visiting staff to remote communities (see Community health services chapter). Increasingly, video conferencing technology is being used to bring specialist psychiatric services and mental health education and training to remote areas of the NT.

Community-based services

The NT has paralleled the rest of Australia in the change from hospital-based mental health services to community-based services. The impetus towards community-based mental health services has been continued with the second national mental health plan, agreed upon by all Australian health ministers, which aims to promote community education, mental health promotion and prevention, and partnerships between services that link consumers with supports such as housing, employment, education and transport (H&FS 1998).

In the NT, there remains a need for greater access to culturally appropriate services for Aboriginal people and people from non-English speaking backgrounds. Mental health services need also to reach out through education and health promotion to schools, youth services, Aboriginal communities and the general community. These challenges may be easier to meet in the NT, where change has been constant and entrenched habits of service delivery are almost unknown.

New directions of consumer involvement, culturally appropriate services and prevention of mental health problems in the NT include:

- coordinating youth suicide prevention across government and non-government sectors
- using traditional healers (ngunkaris) to facilitate the assessment and treatment of disturbed community members in the region where SA, WA and the NT meet
- forming consumer advisory groups in Darwin and Alice Springs

Despite these advances, the NT faces geographical constraints and cross-cultural challenges in delivering community-based services.

A substantial proportion of the NT population lives in rural and remote areas: 27% compared with 12% in Victoria and NSW in 1996 (ABS 1997a). Mental health services are concentrated in the Territory's urban centres. The high cost of providing services to a small population that is widely dispersed is one difficulty in providing mental health services to remote areas. Another is recruitment and retention of Aboriginal mental health workers, psychiatric nurses and psychiatrists.

For these reasons, the community focus of mental health treatment is being gradually introduced to NT remote areas. Treatment of serious illness sometimes requires the intensive care of an acute psychiatric ward, but hospitalisation can be minimised when support and follow-up services are available in the community. Specialist assessment of people with a mental illness continues to take place in hospitals, despite the long-distance travel often required (in some cases, hours in an aeroplane), despite the days or weeks away from home at an already stressful time, and despite the best support being at home with the person's family network, which is also the best place to undertake their psychiatric assessment.

Aboriginal people

Aboriginal people are a significant proportion of the NT population, 28% in 1996 (ABS 1997b). The majority of Aboriginal people live outside the NT's urban centres (ABS 1998a).

Cultural and language differences compound the geographical gap between NT Aboriginal people and access to mental health services. The marked differences between the traditional western model of health and illness and traditional Aboriginal perspectives, which regard all social, spiritual and physical aspects of life as interrelated, adds to the difficulty of diagnosis. Many NT Aboriginal people speak English as a second or third language—for example, in 1996, 97% of Aboriginal people over five years of age in Central Australia spoke an Aboriginal language (ABS 1998b).

Ways in which Territory Health Services has sought to overcome these difficulties include:

- employing Aboriginal mental health workers in urban and rural areas
- providing crisis intervention that enables people with mental illnesses to remain in their communities with specialist support
- establishing multidisciplinary teams that specialise in the assessment and treatment of people from remote areas who need to be transferred to a hospital-based service.

Patterns of mental illness

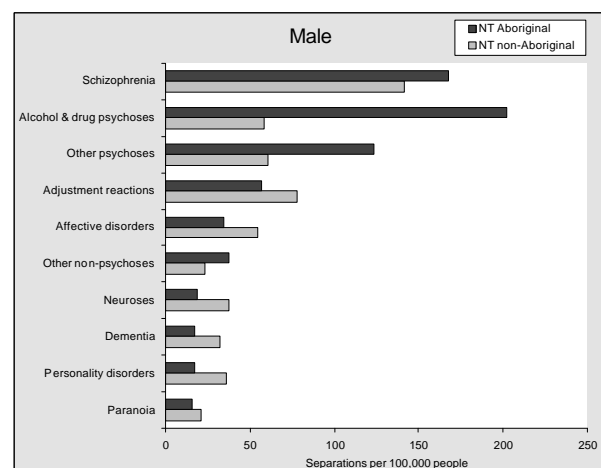
Understanding of mental health issues in the NT, as elsewhere in Australia, is impeded by the scarcity of information about the number of people with mental illnesses and the patterns of mental illness they suffer,

as well as the numbers who seek help from general practitioners and use other community services. Better data collection systems are needed to assist in the planning of mental health services in the NT and enable Territorians to draw meaningful conclusions about their own mental health. The introduction of Territory Health Services Community Care Information System (CCIS), which includes mental health services information, is an important step towards this goal.

The main reliable and comprehensive source of information about mental illness in the NT is hospital inpatient data, which is the primary source of the data discussed in this chapter. Hospitalisation data provide an incomplete picture of mental illness, as they include only episodes of mental illness that are serious enough to put people in hospital—and some severe episodes of mental illness are treated in the community. Nevertheless, data from the NT hospital morbidity dataset provides useful information about severe mental illness in our community and about the utilisation of NT inpatient psychiatric services.

Other data sources include the national census, deaths data related to suicide and the 1997 national mental health and wellbeing survey, which is the most comprehensive survey ever undertaken on the prevalence of mental illness among Australian adults. This survey has limited local application, however, because it includes only a small number of people from the NT, no Aboriginal residents and no people from remote areas (ABS 1998c).

6.1 NT male mental illness hospital admission rates 1993 to 1997

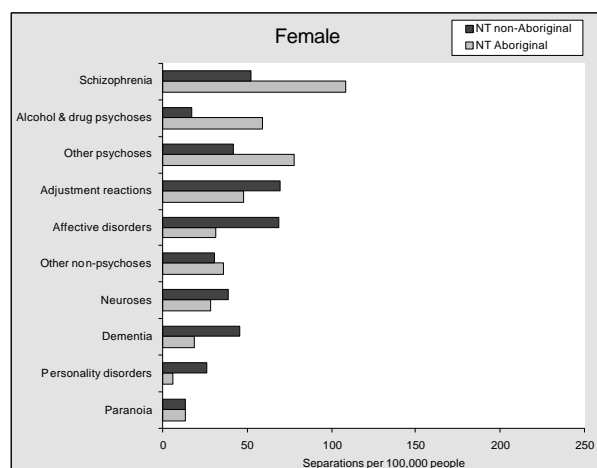


Notes: Age-adjusted hospital separation (admission) rates per 100,000 people, by principal diagnosis, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

In the NT between 1993 and 1997, Aboriginal males were admitted to hospital for treatment of mental

6.2 NT female mental illness hospital admission rates 1993 to 1997



Notes: Age-adjusted hospital separation (admission) rates per 100,000 people, by principal diagnosis, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

illness slightly more often than non-Aboriginal males; there was little difference between the rates for Aboriginal and non-Aboriginal females (graphs 6.1 and 6.2). The higher rate for NT Aboriginal males, compared with their non-Aboriginal counterparts, related to their hospitalisation for alcohol and drug psychoses.

The high levels of physical ill health in the Aboriginal community are likely to render Aboriginal people more vulnerable to mental health problems, as do issues such as unemployment, socioeconomic status and housing. Stress may cause a range of mental illnesses including depression, other affective disorders and psychosis. For more information, see the Underlying causes chapter.

Psychotic disorders are characterised by distorted thinking and behaviour. Psychotic disorders include:

- schizophrenia, a form of psychosis characterised by episodes of abnormal perception and beliefs
- alcohol and drug induced psychoses
- paranoia, a mental illness characterised by delusions, often of persecution

Non-psychotic mental disorders include:

- adjustment reactions, which are brief psychiatric disorders resulting from stress
- affective disorders, which are mental illnesses characterised by abnormalities of mood
- neuroses, including anxiety-related illnesses such as phobias and obsessive-compulsive disorders
- personality disorders, characterised by a pervasive pattern of maladaptive behaviour

Mental illness also includes dementia, an illness which usually occurs in the elderly, characterised by impaired memory, judgement and intellect, and which may be accompanied by psychotic symptoms.

See Appendix A for specific ICD-9 codes included in each category.

Compared with NT non-Aboriginal people, NT Aboriginal people were more likely to be diagnosed with psychosis and less likely to be diagnosed with affective disorder (table 6.3). It is unclear whether this represents a pattern of illness in the community or incorrect diagnosis (see the section on Psychosis later in this chapter).

6.3 NT mental illness hospital admission rates 1993 to 1997

Mental Disorder	Male		Female	
	NT Aboriginal	NT non-Aboriginal	NT Aboriginal	NT non-Aboriginal
Schizophrenia	168	142	108	52
Alcohol & drug psychoses	202	58	59	17
Other psychoses	124	61	78	42
Adjustment reactions	57	78	48	70
Affective disorders	34	55	32	69
Other non-psychoses	38	23	36	31
Neuroses	19	38	28	39
Dementia	17	33	19	46
Personality disorders	17	36	6	27
Paranoia	16	21	13	13
Total	692	544	427	405

Notes: Age-adjusted hospital separation (admission) rates per 100,000 people, by principal diagnosis, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

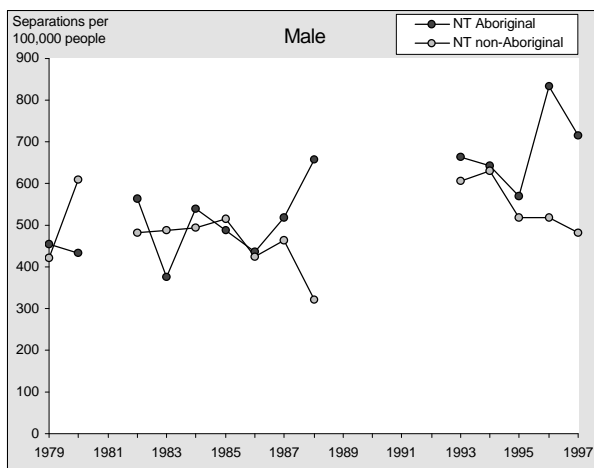
In the NT between 1993 and 1997, schizophrenia and alcohol and drug psychoses were the most common types of mental illness requiring hospitalisation, particularly in males. In females, adjustment reactions and affective disorders were also common reasons for hospitalisation.

Australia-wide, men are hospitalised far more frequently than women for treatment of most types of mental illness. This is particularly so for alcohol and drug psychoses, and schizophrenia. Of Australians with a mental illness, more than half of women and one-third of men reported also having another disorder (either physical or mental). The coincidence of mental illness and substance misuse is significant (ABS 1998c).

For Australia as a whole in 1997, men and women had similar overall prevalence rates of mental disorder, although after 35 years of age women were more likely to have a mental disorder than men. The type of mental disorder was not the same in each sex—women were more likely to have anxiety and affective disorders (ABS 1998c).

Trends over time

6.4 NT male mental illness hospital admission rates 1979 to 1997

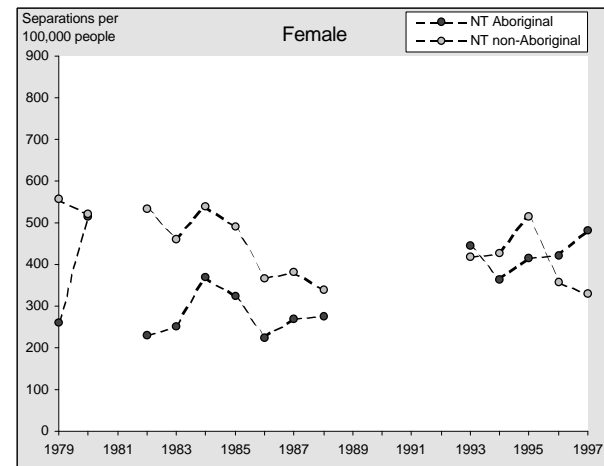


Notes: Hospital separations (admissions) with a principal diagnosis of mental illness
Age-adjusted hospital separation rates per 100,000 people, standardised to Australian 1991 population
Data for 1981 and 1989 to 1992 are incomplete

Data: Epidemiology Branch, THS

The hospitalisation of NT non-Aboriginal people with mental illness changed little between 1979 and 1997, increasing slightly for males and decreasing somewhat for females (graphs 6.4 and 6.5). By contrast, NT

6.5 NT female mental illness hospital admission rates 1979 to 1997



Notes: Hospital separations (admissions) with a principal diagnosis of mental illness
Age-adjusted hospital separation rates per 100,000 people, standardised to Australian 1991 population
Data for 1981 and 1989 to 1992 are incomplete

Data: Epidemiology Branch, THS

Aboriginal people, both men and women, were hospitalised at considerably higher rates between 1993 and 1997 than they had been in the 1980s.

The increasing hospitalisation rate of NT Aboriginal people for mental illness may be because they are suffering more mental health problems, or it may be that previously neglected mental illness is now being better recognised and treated. The former is supported by the increasing numbers of NT Aboriginal people who are committing suicide (see section later in this chapter). Increased rates of substance misuse and increased pressure on traditional Aboriginal culture may also be playing a part.

On the other hand, increased access to health services, particularly general practitioners, Aboriginal mental health workers and other primary care services in remote communities may be increasing the detection and referral to hospital of people who would previously have remained untreated. The steady increase in NT Aboriginal hospital admission rates over the past twenty years, for almost all types of illness, indicates that increasing access to hospital services (see the Hospital services chapter) is at least part of the reason for increasing mental illness hospitalisation rates.

It may also be that unusual behaviours which previously were accepted or otherwise managed in the Aboriginal community are now being diagnosed and treated as psychiatric conditions. The most likely explanation is a combination of all of these changes.

Psychosis

Most NT hospital admissions for mental illness are for psychotic illnesses, which include schizophrenia and drug-induced psychosis. The key symptoms of these illnesses are distressing and, in the case of schizophrenia, tend to persist over long periods of people's lives. They include delusions, hallucinations—for example, hearing voices—and disordered thoughts that cause communication problems. One consequence is that a very high proportion of people with psychotic illnesses become socially isolated (Jablensky and others 1999).

The over-representation of Aboriginal people among Territorians hospitalised for psychosis (see graphs 6.1 and 6.2) may be a result of incorrect diagnosis. The use of Aboriginal mental health workers to assess Aboriginal inpatients presenting with delusions and hallucinations has led to the recognition that spirits, both seen and heard, may be manifestations of a valid cultural experience rather than psychosis. This points to the need to develop culturally-appropriate assessment tools in order to accurately diagnose psychiatric illnesses in Aboriginal people.

There are common themes in the onset of early psychosis, such as the schoolboy who gradually attracts attention through his increasingly withdrawn or unusual behaviour, whose schoolwork deteriorates, who may be using marijuana regularly and who finally shares a secret world disturbed by hallucinations, persecutory beliefs and confusion. The sooner he is treated, the sooner he has an opportunity to share his fear and loneliness, and the sooner he and his family understand the nature of his illness, the better his outcome is likely to be.

Substance misuse

The combination of mental illness and a substance misuse disorder is an increasingly recognised problem. This combination of disorders is referred to as having a 'dual diagnosis'.

Substance misuse may produce mental illness, or it may be an attempt to relieve the symptoms of an existing mental illness (but usually worsens the original illness), or it may simply be a coincidental behaviour. In all cases it complicates the treatment of a person's mental illness and threatens their recovery.

In the NT in the years 1993 to 1997, alcohol and drug psychoses were the third most frequent type of mental

illness causing hospital admission (see table 6.3). Alcohol consumption is particularly high in the NT (see the Substance misuse chapter). Over this period, the number of males admitted to NT public hospitals with alcohol and other drug psychoses was four times higher than the number of females. This is consistent with information on the prevalence of substance misuse in Australia.

In 1997, one in five Australian men aged between 18 and 24 years reported a substance misuse disorder. Men with a mental illness were more likely than women to have a substance misuse disorder as well as their other mental illness (13% in combination with anxiety disorders and 8.4% in combination with affective disorders) (ABS 1998c).

People who have both a mental illness and a substance misuse disorder use more health services than people with a mental illness alone. The national mental health and wellbeing survey found that 66% of people with more than one mental disorder were likely to use mental health services whereas for people with only one mental health problem the figures were: 56% for people with affective disorder; 28% for people with anxiety; and 14% for people with a substance misuse disorder (ABS 1998c).

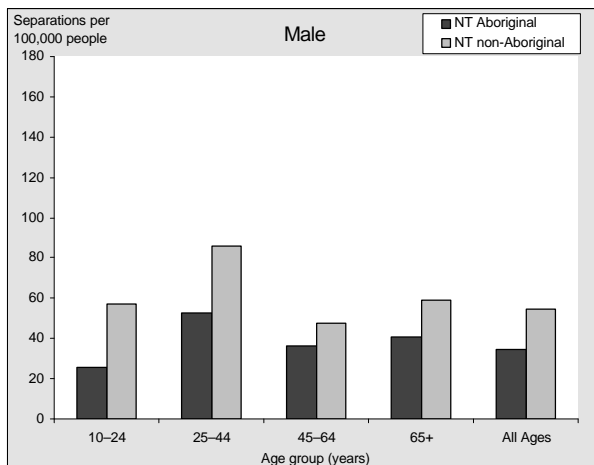
With the high level of alcohol misuse in the NT, the use of services by those with both a substance misuse disorder and mental illness can be expected to be particularly high. There is a need for treatment services targeting people suffering from both mental illness and a substance misuse disorder, together with the promotion of reduced alcohol and other substance misuse in the wider community.

Depression

Depression is one of a range of mental illnesses called affective disorders, which are characterised by mood disturbances. Another type of affective disorder is bipolar affective disorder (manic depression), which is marked by depressed and elevated mood swings.

Affective disorders are one of the more common reasons for NT non-Aboriginal people being hospitalised with mental illness. From 1993 to 1997, affective disorders accounted for 11% of mental illness hospital admissions in NT non-Aboriginal men and 18% in non-Aboriginal women. Hospitalisation for affective disorders was not as common in Aboriginal people, accounting for only 6% of separations in the same period (THS 1999).

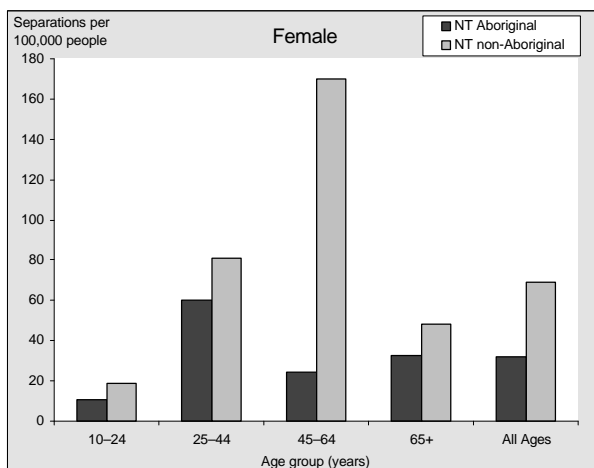
6.6 NT male hospital admission rates for affective disorders 1993 to 1997



Notes: Age-specific hospital separation rates per 100,000 people
Age-adjusted hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

6.7 NT female hospital admission rates for affective disorders 1993 to 1997



Notes: Age-specific hospital separation rates per 100,000 people
Age-adjusted hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

In NT men, between 1993 and 1997, hospitalisation rates for affective disorders were similar across all age groups, and higher in non-Aboriginal than Aboriginal men, particularly in those aged 25 to 44 years (graph 6.6). In NT non-Aboriginal women, the hospitalisation rate for affective disorders was particularly high in those aged 45 to 64 years (graph 6.7). NT non-Aboriginal women were the group most likely to be admitted with a diagnosis of affective disorder (see graph 6.3). This is consistent with the

findings of the 1997 national mental health and wellbeing survey, which found that women were nearly twice as likely as men to have experienced an affective disorder. The prevalence of affective disorders in women aged 18 to 24 years was three times that in men (ABS 1998c).

The Aboriginal hospital admission rate for affective disorders is approximately half that of non-Aboriginal people, for both men and women. While this may indicate that this type of mental illness is less common in Aboriginal people, it may also be that such illnesses are diagnosed as psychosis in Aboriginal people, or that they seek or are able to access help for these problems less often than non-Aboriginal people.

Other research suggests high rates of affective disorder in the Aboriginal population. The NSW Mental Health Survey (Swan & Fagan cited in Swan & Raphael 1995) found that 25% of Aboriginal medical patients were diagnosed as having a mental health problem. McKendrick and others (1992) found that 54% of Aboriginal adults attending a Melbourne community health centre had mental health problems.

Depression is a common illness. In 1997, 5.1% of Australians aged 18 years and over had had a period of depressive illness within the previous twelve months (ABS 1998c). Although comparable information is not available for Aboriginal people, it would not be surprising if depression were even more common among the Aboriginal community given the trauma experienced by the stolen generation, and the high rates of unemployment, socioeconomic and housing disadvantage and imprisonment experienced by Aboriginal people. See the Underlying causes chapter for more information.

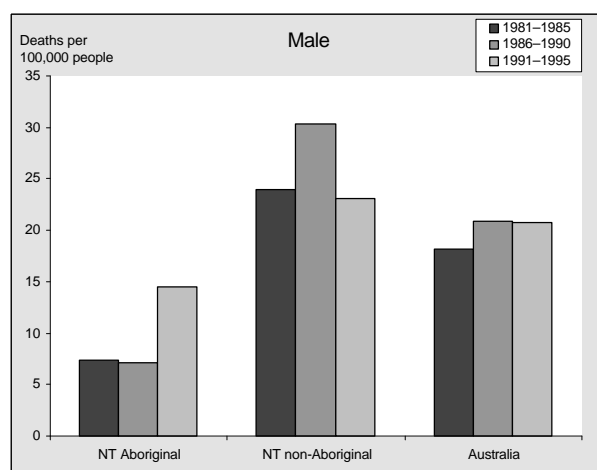
Powerful factors in the community—primarily stigma and ignorance—still lead to depression being undiagnosed and untreated even though it can be a seriously debilitating illness, the effects of which are often underrated. The extent to which depression disables sufferers is comparable to that of other chronic diseases such as diabetes and arthritis. The World Health Organisation reports that, worldwide in 1990, depression was responsible for more than one in every ten years of life lived with a disability (Murray & Lopez 1996). Depression also commonly occurs in people with physical illnesses, and may impair their ability to recover from or cope with their physical disability.

Suicide and self-inflicted injury

Suicide is far more common in males than females. In the fifteen years from 1981 to 1995, there were 261 male suicides but only 34 female suicides in the NT (Dempsey & Condon 1999). Similarly, in 1996, 81% of Australia's 2,393 suicides were male (H&AC 1998).

Australian suicide rates are higher than those of the European nations from which our major migrant groups are drawn, but similar to those of Canada, the United States and New Zealand (Cantor, Neulinger & De Leo 1999). Australia's overall suicide rate of 13 deaths per 100,000 people in 1996 was the same as the average for the previous 75 years (H&AC 1998).

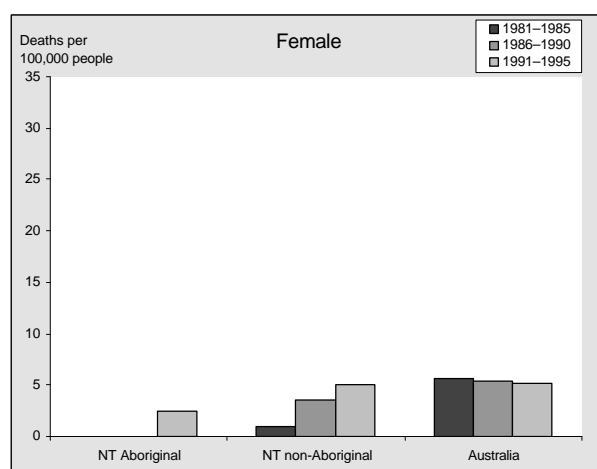
6.8 NT male suicide trends 1981 to 1995



Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

6.9 NT female suicide trends 1981 to 1995



Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

6.10 NT suicides 1981 to 1995

	NT Aboriginal	NT Non-Aboriginal	NT Total
Male			
1981-1985	6	52	58
1986-1990	5	88	93
1991-1995	15	72	87
Total	30	231	261
Female			
1981-1985	0	3	3
1986-1990	0	11	11
1991-1995	3	10	13
Total	3	31	34

Note: Number of suicides

Source: Dempsey & Condon 1999

For NT non-Aboriginal people in the years 1991 to 1995 the male suicide rate was higher than the Australian rate, while the female rate was similar to the Australian rate but had increased over the previous decade (graphs 6.8; 6.9). In contrast, suicide was uncommon in NT Aboriginal people—in the years 1991 to 1995 the NT Aboriginal suicide rate was considerably lower than the Australian rate for both males and females. However, the male rate had more than doubled over the previous decade, and while there were only three Aboriginal female suicides in these five years, there had been none for the previous ten years (table 6.10).

6.11 NT suicide deaths 1994 to 1997

	Male	Female	Total
NT Aboriginal			
1994	5	0	5
1995	3	0	3
1996	7	1	8
1997	9	2	11
NT non-Aboriginal			
1994	13	1	14
1995	19	1	20
1996	21	6	27
1997	24	3	27
NT total			
1994	18	1	19
1995	22	1	23
1996	28	7	35
1997	33	5	38

Note: Number of suicide deaths registered in the NT each year

Source: ABS 1999

The number of suicides in the NT has increased considerably over recent years, for both Aboriginal and non-Aboriginal people (table 6.11). In 1997, the overall NT suicide rate was 21.5 per 100,000 people, almost 50% higher than the Australian rate (14.6) (ABS 1999). In some Aboriginal communities, suicide has become a major problem in the past few years. One Aboriginal community of 2000 people experienced four suicides in two months during 1998—applying the Australia-wide rate to a community of this size, we would expect only one suicide every four years.

These data confirm early research by Eastwell (1988), which indicated very low rates of suicide in Aboriginal communities, and later findings of the Royal Commission into Aboriginal Deaths in Custody (1991) and Radford and others (1991), which suggested increasing rates of suicide and suicide attempt.

A recent detailed review of Aboriginal suicide in north Queensland communities points to the importance of a community-based approach in successfully reducing the incidence of suicide in Aboriginal communities. At Yarrabah, a community of approximately 1,500 Aboriginal people, the incidence of suicide dropped from five deaths in 1995 to no deaths in 1997 and 1998. The key features of the Yarrabah approach were (Hunter & others 1999):

- community control of community-based strategies
- moving from a crisis response to a coordinated response in 1995
- a life promotion program that developed out of the original crisis intervention group
- closure of the canteen, resulting in sales of takeaway alcohol only
- opening of a museum, which became a focus for educational and cultural activities

Youth suicide is a national concern. The Australian suicide rate for males aged 15 to 24 years more than doubled between 1970 and 1995 (Cantor & others 1999). It is not clear whether the same trend is occurring in the NT because youth suicide statistics have not been published.

Self-inflicted injury

Self-harm behaviour and substance abuse are both risk factors for suicide. Self-inflicted injury was the principle diagnosis for 645 hospital admissions (235 Aboriginal and 410 non-Aboriginal) to NT public

hospitals between 1993 and 1997. Of the 410 non-Aboriginal people, 45% were also diagnosed with a non-psychotic mental illness, 22% with alcohol or drug dependence/misuse and 9% with a psychotic illness. Mental illness was diagnosed less often in Aboriginal people hospitalised with self-inflicted injury, and alcohol or drug dependence/misuse was more common than other forms of mental illness. Of the 235 Aboriginal people hospitalised with self-inflicted injury, only 19% were also diagnosed with a non-psychotic mental illness and 6% with a psychotic illness, but 35% were diagnosed with alcohol or drug dependence/misuse (THS 1999).

Young people

Mental illness is most common in the young adult years. In 1997, Australians aged 18 to 24 years had the highest prevalence of mental illness: 27% reported having had an episode of mental illness in the preceding twelve months. The prevalence of mental disorders progressively decreased in the older age groups (ABS 1998c).

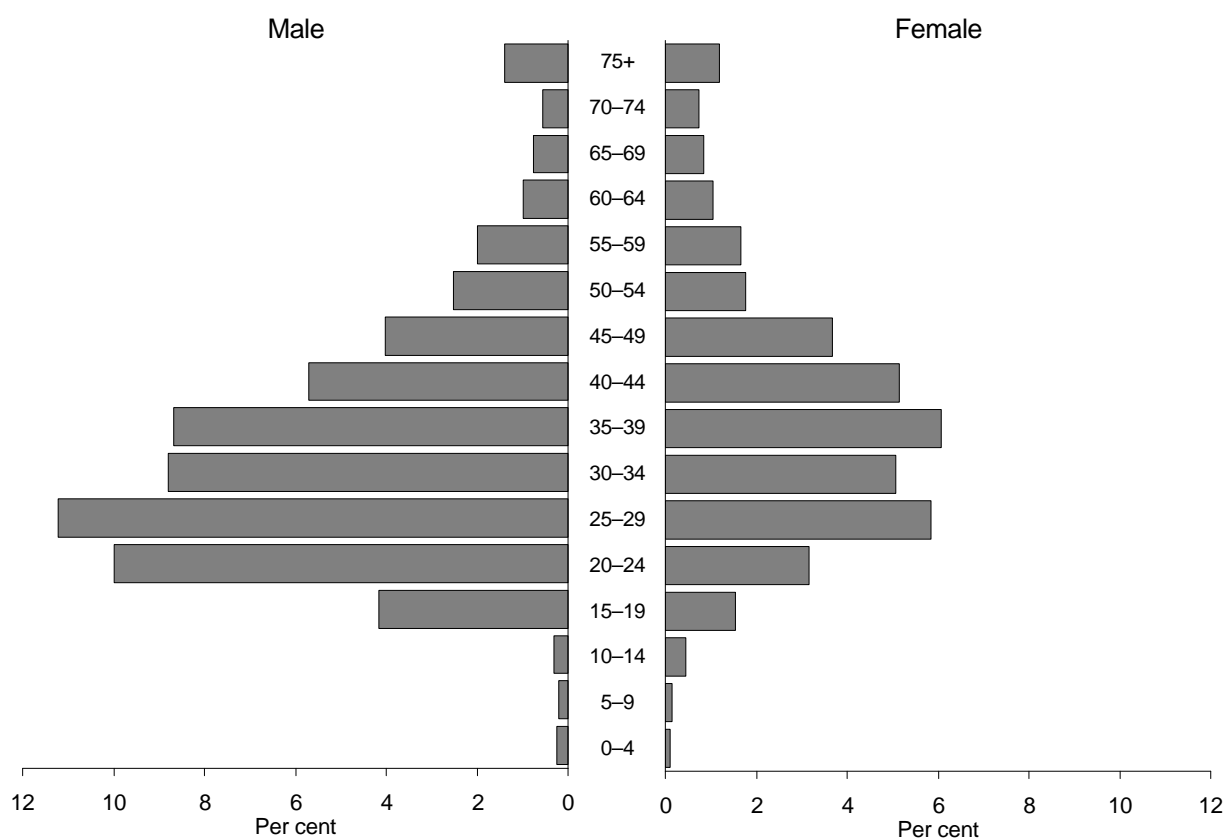
This national pattern is reflected in NT hospital separations data for 1993 to 1997, which show the majority of hospitalisations for mental illness were in the age range 20 to 39 years: 62% for males and 54% for females (graph 6.12).

Schizophrenia, alcohol and other drug psychoses and adjustment reactions were the commonest reasons for mental illness hospitalisation in Territorians aged 15 to 24 years from 1993 to 1997 (graph 6.13).

The diagnosis of schizophrenia may be unreliable in adolescents and young adults, particularly in Aboriginal people, because the profile of psychosis changes over time. Accurate diagnosis of psychosis in Aboriginal people remains problematic because of language and cross-cultural issues (see the section on Psychosis earlier in this chapter). Nevertheless, from 1993 to 1997, in this age group:

- the NT hospitalisation rate for schizophrenia was seven times higher for males than females
- Aboriginal Territorians, particularly males, had higher hospitalisation rates for schizophrenia and other psychoses than non-Aboriginal Territorians

6.12 All NT mental illness hospital admissions 1993 to 1997



Note: Proportion in each age group of all hospital separations (admissions) for mental illness

Data: Epidemiology Branch, THS

6.13 NT mental illness hospital admission rates: 15 to 24 years 1993 to 1997

Mental Disorder	Male		Female	
	NT Aboriginal	NT non-Aboriginal	NT Aboriginal	NT non-Aboriginal
Schizophrenia	147	258	30	34
Adjustment reactions	94	110	39	88
Other psychoses	106	68	48	26
Alcohol & drug psychoses	127	88	13	17
Affective disorder	41	82	17	28
Neuroses	8	46	35	28
Personality disorders	16	76	0	17
Paranoia	29	26	4	9
Other non-psychoses	70	30	52	26
All mental disorders	638	785	238	272
Number of separations	156	392	55	127

Note: Age-specific hospital separation (admission) rates per 100,000 people, by principal diagnosis

Data: Epidemiology Branch, THS

In the NT, as elsewhere in Australia, the trend is to address the problem of early psychosis in our youth (see inset) by early intervention, collaborative treatment planning, case management and education for young people and their families. These new approaches are being disseminated from urban to remote areas of the NT through staff education, outreach services, video conferencing and implementation of the mental health module of THS' integrated client management information system, CCIS.

A national youth suicide prevention strategy (H&FS 1997) operated from 1995 to 1999, during which time the NT initiated 45 projects aimed at reducing youth suicide. Specific NT initiatives include the planned coordination of youth suicide prevention strategies across government and non-government sectors and:

- a Tiwi Islands community-based project, which includes the appointment of Life Promotion

George's story: the difficulties of assessing and treating early psychosis

George is a young man. He is married and has a young daughter. Until recently George was well liked in his community. He was a pretty good football player and he sometimes played drums in a local band. He was funny and made the family laugh all the time. George likes to come to town and go drinking. Recently his brother and cousins have started to stay away from him when he gets too drunk. They say he is silly and always wants to fight. They also say he stays like that for weeks after they have all been dry back home. He has started to smoke more and more gunja. Most days now he is stoned. George's wife is worried about him too. She says he hasn't been sleeping much at night. He won't talk to her, and he doesn't play with their daughter like before. He just seems to lay around all day.

George's father caught him talking and giggling to himself when no-one else was around. He decided not to say anything to George at the time, but has been thinking about this a lot. He talked to an old man who knows about these things. The old man told him that he would help to find the right Aboriginal way, and to talk to the clinic. One day George wandered off into the bush after getting up in the early morning really cranky and smashing the windscreen of his car. His father says he hasn't hurt himself, but everyone is worried about what might happen next. The police know about George acting silly, but are not going to do anything yet.

Officers who are working with the community to develop locally effective suicide prevention strategies

- the Central Australian Young People at Risk Action Committee, which has coordinated an inter-agency response to youth suicide that mobilises support for people affected by successful suicide attempts
- Daly River men's and boys' workshops, in which mental health services work with community elders to support cultural education for Aboriginal youth and young men
- Parents Teachers and Children Exploring Together: a project based in the Darwin rural area that addresses the social skills of schoolchildren to reduce levels of conflict, anxiety and depression, particularly in Aboriginal children and their families
- participating in the national pilot program 'Mind Matters', which is introducing mental health education into the school curriculum to promote the mental health and wellbeing of young people

Strategies to prevent youth suicide need to be broadly based: across communities, schools and all health care services—not just mental health services. We need to encourage our youth to talk about feelings, share their problems, de-stigmatise mental illness and resist accepting the tragedy of suicide as an unfortunate but normal part of life.

Older people

Australia-wide, the highest suicide rates are in men aged over 75, however the numbers of deaths in this age group are relatively low compared with those for younger adult males (H&AC 1998).

The major distinctive feature of mental health in the aged is the occurrence of dementia, which causes loss of memory and intellectual ability, impaired judgement, and psychotic symptoms in some. Dementia is rare below age 65. Of NT non-Aboriginal hospitalisations for mental illness in people aged 55 and over between 1993 and 1997, 18% were for dementia; the proportion was much higher in those aged over 75 years (THS 1999).

Hospitalisation from dementia is much less common in NT Aboriginal people: from 1993 to 1997, the NT hospitalisation rate for dementia in Aboriginal people was 50 per 100,000, less than half that in non-Aboriginal people (table 6.14).

It is not clear whether NT Aboriginal people's lower rate of hospitalisation for dementia is because older

6.14 NT mental illness hospital admission rates: 55 years and over 1993 to 1997

Mental Disorder	NT	
	Aboriginal	Non-Aboriginal
Other non-psychoses	156	100
Schizophrenia	99	105
Dementia	50	109
Alcohol & drug psychoses	57	57
Affective disorder	21	88
Other psychoses	71	28
Adjustment reactions	0	50
Personality disorders	14	33
Paranoia	14	31
Neuroses	7	28
Depression	0	16

Note: Age-specific hospital separation (admission) rates per 100,000 people, by principal diagnosis

Data: Epidemiology Branch, THS

Aboriginal people are less prone to dementia or, instead, are not admitted to hospital but rather are cared for in their communities. Because these rates are based on a relatively small number of hospital admissions, the low rate in Aboriginal people may change as the number of admissions fluctuates from year to year.

Other than dementia, from 1993 to 1997, the most common reasons for hospitalisation for mental illness in Territorians aged over 55 years were: for Aboriginal people, alcohol and other drug psychoses and schizophrenia; and for non-Aboriginal people, schizophrenia and affective disorder (table 6.14).

6.15 NT dementia hospital admissions 1993 to 1997

Age Group (years)	NT		NT Total
	Aboriginal	Non-Aboriginal	
No. of Separations			
55–64	0	2	2
65–74	4	15	19
75+	3	46	49
Total	7	63	70
Rate			
55–64	0	6	—
65–74	99	97	—
75+	202	682	—

Notes: Number of public hospital separations (admissions)
Age-specific hospital separation rate per 100,000 people

Data: Epidemiology Branch, THS

Hospitalisation for dementia is uncommon before age 75. In the years 1993 to 1997, 70% of people hospitalised for dementia in the NT were aged 75 years or over, and only two were aged below 65 years (table 6.15).

Specialist mental health services for older people (psychogeriatric services) were first provided in the NT in 1997. However, by 1999, there were no dedicated psychogeriatric hospital beds in the NT. Although the NT's population is relatively young, the trend towards a higher proportion of aged people will require resources to be directed towards psychogeriatric services in the NT as elsewhere in Australia.

References

- ABS 1997a, *Australian Demographic Statistics*, cat no 3101.0, Canberra.
- ABS 1997b, *Demography Northern Territory*, cat no 3311.7, Darwin.
- ABS 1998a, *Census of Population and Housing: Aboriginal and Torres Strait Islander People, Northern Territory*, cat no 2034.7, Canberra.
- ABS 1998b, *Census of Population and Housing: Indigenous Community Profile (ATSIC regions Alice Springs, Apatula and Tennant Creek)*, cat no 2020.0, Canberra.
- ABS 1998c, *Mental Health and Wellbeing: Profile of Adults, Australia, 1997*, cat no 4326.0, Canberra.
- ABS 1999, *Cause of Death Australia (series)*, cat no 3303.0, Canberra.
- Baume P, Cantor C & McTaggart P 1998, *Suicides in Queensland: A Comprehensive Study 1990–1995*, Australian Institute for Suicide Research and Prevention, Brisbane.
- Cantor CH & Baume PJ 1998, 'Access to methods of suicide: what impact?', *Australian and New Zealand Journal of Psychiatry*, vol 32, no 1, pp 8–14.
- Cantor CH, Neulinger K & De Leo D 1999, 'Australian suicide trends 1964–1997: youth and beyond?', *Medical Journal of Australia*, vol 171, pp 137–41.
- Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory, 1979 to 1997*, THS, Darwin.
- Eastwell HD 1988, 'The low risk of suicide among the Yolgnu of the Northern Territory: the traditional pattern', *Medical Journal of Australia*, vol 148, pp 502–7.
- H&AC 1998, *National Action Plan for Suicide Prevention: Consultation Draft*, Canberra.

- H&FS Mental Health Branch web site: <http://www.health.gov.au/hsdd/mentalhe>
- H&FS 1997, *Youth Suicide in Australia: the National Youth Suicide Prevention Strategy*, Mental Health Branch, Canberra.
- H&FS 1998, *Second National Mental Health Plan*, Mental Health Branch, Canberra.
- HS&H 1997, 2nd ed, *Youth Suicide in Australia: A Background Monograph*, Special Health Services Section, Canberra.
- Hunter E, Reser J, Baird M & Reser P 1999, *An Analysis of Suicide in Indigenous Communities in North Queensland: The Historical Cultural and Symbolic Landscape*, report for Mental Health/Health Services Development Branch, H&AC, Canberra.
- Jablensky A and others 1999, *People Living With Psychotic Illness: An Australian Study 1997–1998*, Commonwealth of Australia, Canberra.
- McKendrick J, Cutter T, Mackenzie A & Chiu E 1992, 'The pattern of psychiatric morbidity in a Victorian urban Aboriginal general practice population', *Australia and New Zealand Journal of Psychiatry* vol 26, no 1, pp 40–7.
- Murray CJL & Lopez AD 1996, *The Global Burden of Disease: a Comprehensive Assessment of Mortality and Disability from Diseases, Injuries and Risk Factors in 1990 and projected to 2020*, Cambridge, Massachusetts.
- National Health Strategy (Australia) 1998, *Help where Help is Needed: Continuity of Care for People with Chronic Mental Illness*, Melbourne.
- Pirkis J 1997, *Evaluation of the National Mental Health Strategy: Report of National Stakeholder Consultations*, Centre for Health Program Evaluation, Canberra.
- Radford AJ, Harris RD, Van der Byl M and others 1991, 'Social health among urban Aboriginal heads of households in Adelaide, with particular reference to suicide attempt', *Aboriginal Health Information Bulletin*, vol 15, pp 20–5.
- Royal Commission into Aboriginal Deaths in Custody 1991, *Final Report of the Royal Commission into Aboriginal Deaths in Custody*, 5 vols, (Elliott Johnston Commissioner), AGPS, Canberra.
- Swan P & Raphael B 1995, *Ways Forward: National Consultancy Report on Aboriginal and Torres Strait Islander Mental Health*, AGPS, Canberra.
- THS 1999, Mental health hospital statistics 1993–1997 (unpublished draft report), Epidemiology Branch, Darwin.

Dental health

by John Plummer

The dental health of Territorians depends on:

- public dental health measures put in place to reduce the effects of dental disease
- their knowledge of the causes and effects of dental disease (tooth decay and gum disease)
- the levels of dental care available to them

In the NT, dental care is provided through three main sources: Territory Health Services (THS), the private sector and Aboriginal-funded dental care organisations. THS provides dental care for schoolchildren and disadvantaged adults in urban and rural areas. Public preventive dental health programs include dental health education provided through schools and to special groups such as mothers-to-be. THS also provides advice and information to other arms of government concerning the introduction and maintenance of measures to prevent dental ill health—for example, fluoridation of water supplies.

Dental ill health

Dental ill health has many ramifications that are not always appreciated (diagram 7.1).

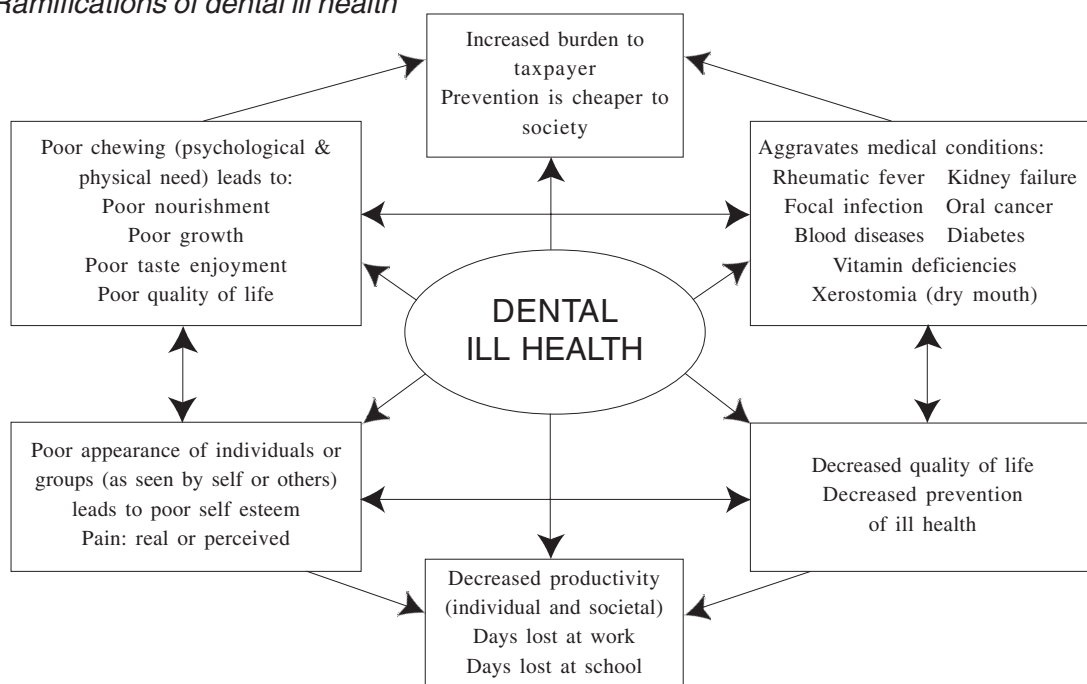
Water fluoridation and dental health

Fluorides are natural salts found in the body—as are the salts of iron, iodine, copper and common salt—and occur naturally in soil, plants and animals. Fluoride is needed in minute quantities to develop teeth and bones. It is effective in reducing tooth decay throughout life, but is most effective during the first 15 years of life.

Fluoride in water works on teeth in two ways: firstly, when combined into the developing dental enamel early in life; and, secondly, when absorbed onto the surface of teeth. Studies have shown that people have as much as 60% less tooth decay where the water supply has adequate fluoride.

Fluoridation was introduced into the Darwin water supply in 1972. Reticulated water in Darwin and Katherine has the level of fluoride adjusted to about 0.5 mg/L. The water supplies in Tennant Creek and Alice Springs are naturally fluoridated. Most other NT communities have fluoride-deficient water supplies. Territory Health Services recommends a

7.1 Ramifications of dental ill health



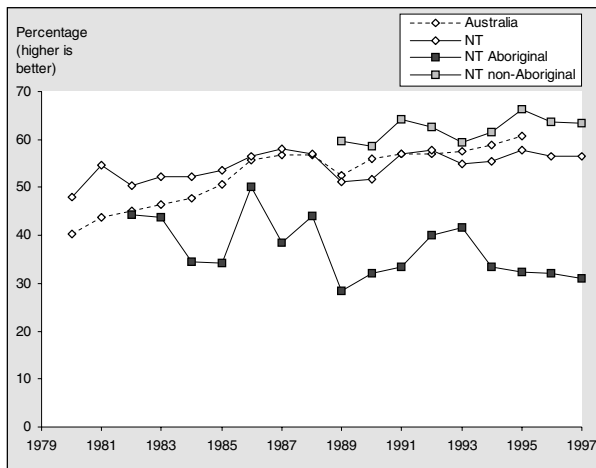
Source: Adapted from THS 1997

fluoride level of 0.5 mg/L (range 0.4–0.6 mg/L) in reticulated drinking water for NT communities with a resident population of 1,000 or more.

Children's dental health

Data on the dental health of children in the NT have been collected for more than 25 years, during which time there has been a rise in the percentages of NT children with no tooth decay.

7.2 dmft trends: decay-free five-year-olds

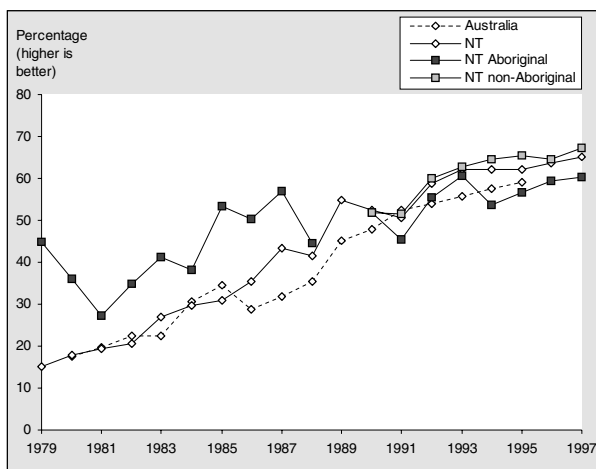


Sources: 1980–1986: Commonwealth Department of Health 1987
1989–1997: AIHW Statistics and Research series nos 1–12

Data: 1987–1988: Commonwealth Department of Health, Australian School Dental Scheme

There has been a steady increase in the overall number of NT five-year-olds with no tooth decay, but a slight downward trend in the number of

7.3 DMFT trends: decay-free 12-year-olds



Sources: 1979–1986: Commonwealth Department of Health 1987
1989–1997: AIHW Statistics and Research series nos 1–12

Data: 1987–1988: Commonwealth Department of Health, Australian School Dental Scheme

Measuring dental health: dmft and DMFT

One measure of the level of dental health in a population is the average number of decayed, missing (due to decay) and filled teeth.

This international standard for comparing dental health is known as dmft for five-year-olds and DMFT for 12-year-olds.

The age of five was chosen for dmft because usually this is the last year when a child has a full set of twenty deciduous (also called baby, milk or primary) teeth but no permanent teeth.

The age of twelve was chosen for DMFT because, by this time, usually a child has shed all their deciduous teeth and grown all their permanent teeth (except the third molars or wisdom teeth).

The lower the dmft or DMFT, the better the dental health of the population.

The higher the percentage of children with a dmft or DMFT score equal to zero, the more successful the public dental health programs are.

Aboriginal children with no tooth decay at the same age (graph 7.2). No research has been done to effectively explain this difference.

There has been a rise in decay-free 12-year-olds from about 15% of the NT population in 1979 to about 65% in 1997 (graph 7.3).

Adult dental health

There are no published studies on the dental health status of adults in the NT. Nevertheless, anecdotal evidence suggests that, in urban areas, the general level of dental health is no better than that in the rest of Australia and, quite probably, not as good. In rural and remote communities, it is worse.

References

AIHW 1989–1997, *The Child Dental Health Survey Australia*, AIHW Statistics and Research series nos 1–12. AGPS, Canberra.

Commonwealth Department of Health 1987, *Dental Health of Children in Australia 1977–1986*, AGPS, Canberra.

THS 1997, *Territory Health Services Annual Report 1996–97*, NTGP, Darwin.

Communicable diseases

by Angela Merianos, Frank Bowden, Vicki Krause, Jan Savage (*Sexually transmitted diseases*), Tania Wallace (*Tuberculosis and Leprosy*)

Great advances have been made in controlling communicable diseases in Australia and other developed countries over the past century. Improved environmental conditions such as better housing, water supplies and waste disposal and developments in medical technology such as antibiotics, vaccines, and surveillance and contact tracing systems have considerably reduced the occurrence and severity of communicable diseases.

However, many communicable diseases remain a serious threat to human health. AIDS, caused by the HIV virus, is a disease that apparently did not exist 20 years ago. Changes in human behaviour, such as greater injecting drug use, has increased the occurrence of hepatitis C. Diseases previously thought to be under control (such as tuberculosis, malaria and gonorrhoea) are becoming more dangerous as they develop resistance to antibiotics.

In the Northern Territory communicable diseases pose a greater threat to the health of the population than in other parts of Australia. Many communicable diseases occur more commonly in the NT than elsewhere in Australia, and much more commonly in Aboriginal than non-Aboriginal Territorians. This chapter presents data on some of the more common, or more serious, communicable diseases in the NT, including relatively rare diseases that have the potential to occur in serious epidemics and those diseases which are preventable by immunisation.

Sources of data on notifiable diseases

The main data source on notifiable diseases is the NT Notifiable Diseases Surveillance System. Over 70 diseases and/or syndromes are currently notifiable in the NT. The list of notifiable diseases was most recently modified in 1999 in accordance with the list of diseases considered important nationally, as well as a number of locally significant diseases (see Appendix B) (THS 1999).

The main source of information on cases of notifiable diseases is the pathology laboratories. Notification

from doctors and hospitals also occurs for some diseases. Additional information on notifiable diseases is obtained from:

- sentinel surveillance systems (sentinel general practices and the Australian Paediatric Surveillance Program)
- special surveillance systems for several specific diseases—meningococcal disease, invasive *Haemophilus influenzae* type b, invasive pneumococcal disease, influenza, tuberculosis, malaria, HIV, and adverse reactions following immunisation
- the hospital morbidity dataset (see the Hospital services chapter)
- active case finding when a disease outbreak occurs.

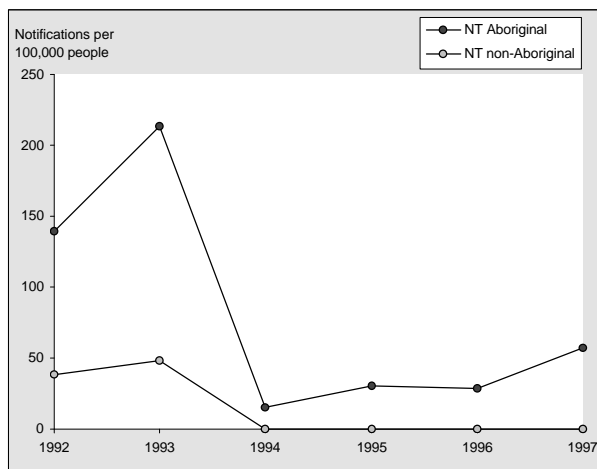
Unfortunately this notification system is not complete for all diseases. In most cases it relies on routinely collected data rather than on active case finding (TB and STDs are exceptions). Doctors frequently forget to notify cases. The criteria for diagnosis of some diseases have changed over time, making monitoring of trends in these diseases difficult. The diagnosis of some diseases is not always confirmed by pathology tests, so laboratory notifications will underestimate the true occurrence of these diseases. As well as these difficulties within the NT, there are also inconsistencies between states in the way communicable disease notification systems work, which make interstate comparisons unreliable for some diseases.

Vaccine preventable diseases

In Australia, children are currently vaccinated against measles, mumps, rubella, diphtheria, tetanus, pertussis, poliomyelitis and *Haemophilus influenzae* type b disease (Hib). The NT also provides hepatitis B vaccination for all infants, and tuberculosis/leprosy vaccination (BCG vaccine) for infants living in remote communities.

Haemophilus influenzae type b (Hib) infection

8.1 NT invasive Hib disease in children under five years 1992 to 1997



Note: 1992 rates are based on hospital separation (admission) data only.

Data: Centre for Disease Control, THS

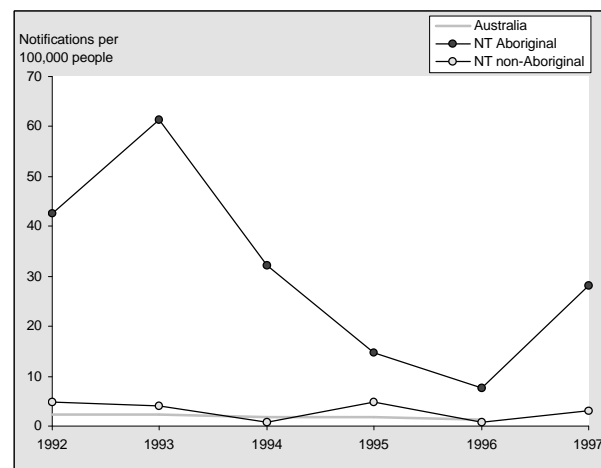
Immunisation against Hib was introduced in the NT in mid-1993 to reduce the occurrence of the serious complications of invasive Hib disease: septicaemia, meningitis and epiglottitis. NT Aboriginal infants previously experienced some of the highest rates of invasive Hib disease in the world (Hanna 1990, Hanna 1992). The incidence of invasive Hib disease among NT children aged under five dropped significantly after that time and has continued at a low rate since then (graph 8.1). There were 107 cases diagnosed in children aged under five from January 1989 to June 1993 compared to twelve cases from July 1993 to December 1996.

Hepatitis B

Vaccination of infants against hepatitis B virus (HBV) commenced in the NT in 1988 for Aboriginal children. Vaccination of non-Aboriginal children commenced in 1990, and was actively promoted from 1993. In 1998 a special program was conducted to vaccinate school-aged children (6–16 years) because of continuing high rates of HBV among adolescents.

A total of 141 new cases of HBV were reported in the years 1992 to 1997. The NT non-Aboriginal HBV notification rate was slightly higher than the Australian rate in most years, while the NT Aboriginal rate was much higher in the early 1990s, but fell considerably from 1993 (graph 8.2). The downward trend since 1993 is partly because of more accurate distinction between new infections and chronic

8.2 Hepatitis B notification rate 1992 to 1997



Note: Australian data not available for 1997

Data: Centre for Disease Control, THS

infections (carriers and those with chronic disease) after 1994. Notification rates were similar in males and females.

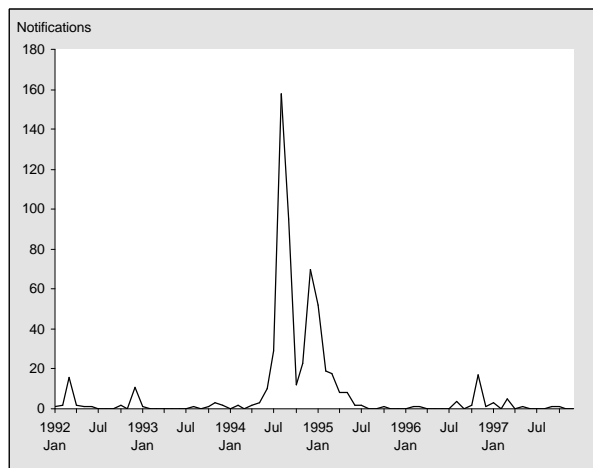
Measles

Immunisation against measles is given as a single dose at twelve months of age, with a booster dose at five years. The first dose is delayed until twelve months because immunisation in the first few months of life is not as effective as at twelve months. Since 1989, measles immunisation has been given using a combined vaccine for measles, mumps and rubella (MMR vaccine).

During the 1980s, NT Aboriginal infants experienced higher rates of sickness and death from measles than non-Aboriginal infants. The first measles immunisation for NT Aboriginal children was recommended at nine months of age instead of twelve months in an attempt to reduce the cases of measles occurring in very young Aboriginal children. A review by the NT Centre for Disease Control (CDC) of measles notification and death statistics in the late 1990s found that Aboriginal infants no longer suffered excess deaths from measles. The recommended age for the first immunisation in Aboriginal infants was subsequently changed to twelve months, in line with non-Aboriginal infants (Miller 1998).

In 1998, Australia conducted a National Measles Control Campaign targeting primary school children, as a first step towards totally eliminating measles in Australia. The recommended age of the second dose was also reduced from ten to four years of age, to be given before the child commenced school.

8.3 NT measles notifications 1992 to 1997



Note: Number of measles notifications per month

Data: Centre for Disease Control, THS

8.4 NT measles notifications by district 1992 to 1997

Year	Darwin	Katherine	Arnhem East	Barkly	Springs Alice	Total
1992	3	0	0	15	18	36
1993	8	0	0	0	0	8
1994	118	16	3	12	255	404
1995	57	16	34	2	1	110
1996	4	9	0	0	13	26
1997	1	3	1	0	6	11
Total	191	44	38	29	293	595

Note: Number of measles notifications per year

Data: Centre for Disease Control, THS

In 1993 a measles epidemic occurred in Australia. It spread throughout the country, but did not commence in the NT until almost 12 months later than in other States. The epidemic peaked in Alice Springs in August 1994 where 139 cases were reported in that month (graph 8.3, table 8.4). The second peak, starting in November 1994, was the result of spread to Darwin, Katherine and East Arnhem districts. The outbreak was largely confined to urban centres. 81% of all notifications were in people under 20 years of age. Infection was almost equally common in males as females.

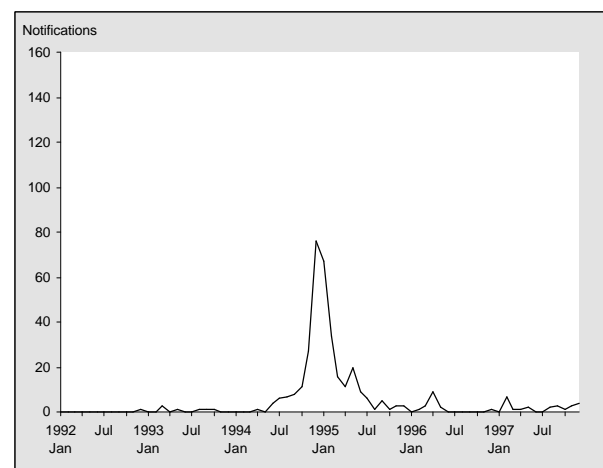
Infants under 24 months of age experience the highest attack rates from measles, and infants under 12 months are at the highest risk of death from measles (Hanna and others 1989). In the years 1992 to 1997 there were 96 hospital admissions for measles: 37% were under 12 months of age and 60% were under

five years of age; 83% were Aboriginal. There were no deaths (Centre for Disease Control, unpublished). During the 1994 measles epidemic in Central Australia, five percent of infants under twelve months of age contracted measles—two percent of non-Aboriginal and eight percent of Aboriginal infants (Lush and others 1994). However, in children aged under twelve months the diagnosis of measles is difficult without blood tests and the rate for infants in this age group may be overestimated.

Pertussis (whooping cough)

Pertussis immunisation is given as a combined vaccine with diphtheria and tetanus (DTP vaccine). In Australia, the initial course is three doses at ages two, four and six months, to prevent the life-threatening complications of pertussis in infancy. Booster doses are given at 18 months and five years. Immunity following pertussis immunisation lasts for only a few years, with little protection remaining in older children (Mortimer 1990). In 1997 a new pertussis vaccine (an acellular vaccine) introduced in the NT considerably reduced the occurrence of mild-moderate vaccine reactions (Nan Miller, personal communication).

8.5 NT pertussis notifications 1992 to 1997



Note: Number of notifications of pertussis infection per month

Data: Centre for Disease Control, THS

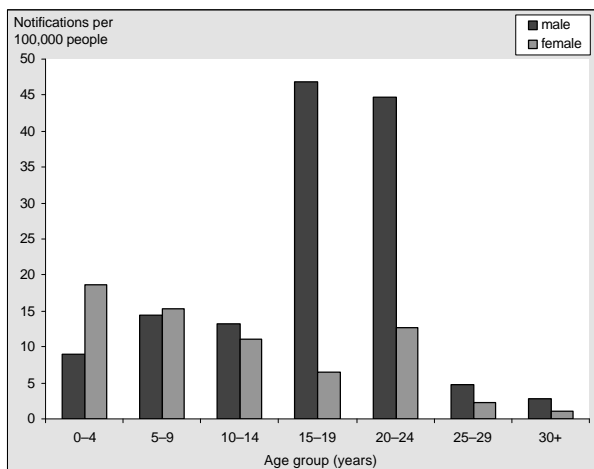
An epidemic of pertussis began in Australia in 1993, with peaks in 1994 and again in 1996–1997. 363 NT cases were notified in that period (out of over 4,000 cases nationally) with a peak of 176 cases in 1995 (graph 8.5). All NT health districts reported cases during this epidemic. The minimum age reported was 20 days, with 28% of cases in people aged over 20 years. The majority (61%) of serious cases of pertussis requiring admission to hospital were infants

aged under six months of age. Two NT infants under six months of age died of pertussis in 1995 (Centre for Disease Control, unpublished).

Rubella

In the years 1992 to 1996 over 18,000 cases of rubella were notified across Australia. Except for an outbreak of disease in 1994 when 49 cases were notified (29 per 100,000), rubella notification rates in the NT were lower than national rates. In the NT, male notifications were twice as common as female. This reflected the past policy of only females receiving the rubella vaccine at twelve years of age. Rubella immunisation of males commenced when the combined measles/mumps/rubella (MMR) vaccine was introduced for immunisation of all infants at age twelve months. In 1994 a booster dose of MMR was introduced for all school children at ten years of age. This booster is now given at age four, prior to school entry.

8.6 NT rubella notification rates 1993 to 1997



Note: Number of rubella notifications per 100,000 people

Data: Centre for Disease Control, THS

In the NT during the years 1993 to 1997, the highest rubella notification rates were in males aged 15–24 (graph 8.6). Only one Aboriginal person was notified with rubella over the whole observation period; rubella is generally a mild illness associated with a faint rash that is difficult to detect on darker skin. In this period there were six hospital admissions for rubella, four of whom were under twelve months of age. There were no deaths attributed to rubella (Centre for Disease Control, unpublished).

Tetanus

There was one case of tetanus reported in the NT in the years 1992 to 1996, a 79 year old woman who survived the infection (Centre for Disease Control, unpublished).

Immunisation coverage rates

8.7 Children fully immunised at 12–14 months March 1999

Vaccine	Northern Territory	Australia
Diphtheria/tetanus/pertussis	79.7	87.6
Oral polio vaccine	79.1	87.3
<i>Haemophilus influenzae</i> type b	84.9	87.4
Fully immunised	77.3	86.1
No. of children	982	63,019

Note: Proportion of children aged 12–14 months on 31 March 1999 who were recorded as having had all immunisations recommended up to that age

Source: HIC 1999

The Australian Childhood Immunisation Register (ACIR) is the official source of national data on immunisation coverage rates for children aged 0–6 years inclusive. The ACIR commenced recording national immunisation data in 1996. In its first years of operation, including 1998, the ACIR underestimated immunisation coverage for the NT because:

- the ACIR is based on the Medicare registration system, but obtains data on NT immunisations primarily from the NT Immunisation Register, which did not include Medicare numbers
- changes in the names of Aboriginal children for cultural reasons, which made matching of immunisation records with Medicare registrations difficult
- some NT vaccine providers did not participate in the ACIR system

Territory Health Services and the ACIR have attempted to remedy these problems to improve the accuracy of ACIR data in future years.

8.8 Selected vaccine preventable diseases notification rates 1992 to 1997

	Year					
	1992	1993	1994	1995	1996	1997
Invasive Hib disease (age <5 only)						
NT Aboriginal	139	214	15	30	29	57
NT non-Aboriginal	39	48	0	0	0	0
NT total	77	112	6	11	11	2
Australia	na	na	na	na	na	na
Hepatitis B — incident						
NT Aboriginal	42	61	32	15	8	28
NT non-Aboriginal	5	4	1	5	1	3
NT total	23	23	15	8	3	10
Australia	2	2	2	2	1	na
Measles						
NT Aboriginal	42	2	386	132	39	4
NT non-Aboriginal	12	6	162	34	5	7
NT total	22	5	236	63	14	6
Australia	9	26	27	7	3	na
Pertussis						
NT Aboriginal	0	2	34	115	2	6
NT non-Aboriginal	0	4	92	78	12	15
NT total	1*	4	82	101	9	12
Australia	4	23	32	24	22	na
Rubella						
NT Aboriginal	nn	0	0	0	0	2
NT non-Aboriginal	nn	6	29	5	5	3
NT total	nn	8	29	6	4	4
Australia	23	22	19	24	16	na

Notes: Number of notifications per 100,000 people
 nn Not notifiable
 na Not currently available
 * NT data unreliable for pertussis notifications in 1992
 NT total rates include cases for whom Indigenous status was not recorded

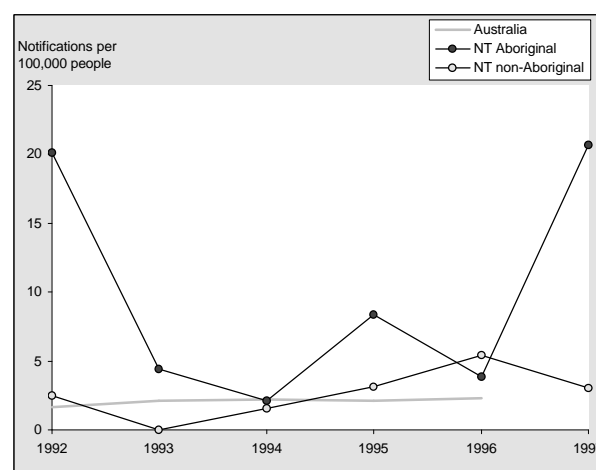
Data: Centre for Disease Control, THS

Meningococcal infections

Infection with the meningococcal bacteria (*Neisseria meningitidis*) may affect several parts of the body, the most serious of which are meningitis (an infection of the surface of the brain and spinal cord) and septicaemia (infection of the blood), both of which may be fatal.

The NT experiences higher rates of meningococcal disease than Australia generally (graph 8.9). In the years 1992 to 1997, 52 cases were notified in the NT. Children under five years of age experience the highest attack rates; 53% of hospital admissions for meningococcal disease were under five years of age and 76% were under 20 years; the average length of stay was 14 days for Aboriginal and 10 days for non-Aboriginal cases. There were two deaths (both male, aged between five and ten years) from meningococcal disease during this period (Centre for Disease Control, unpublished).

8.9 Invasive meningococcal infection notification rates 1992 to 1997



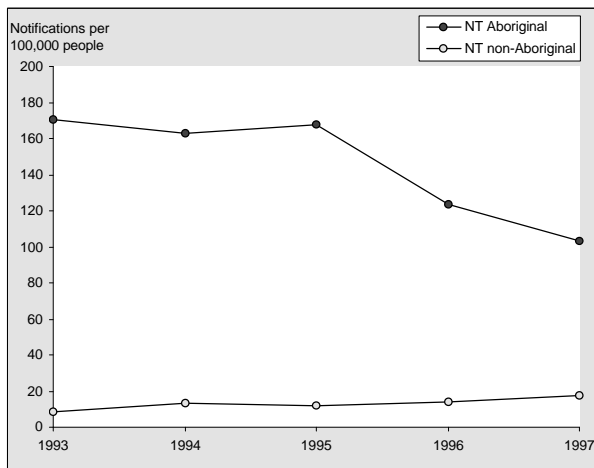
Note: Australian data not available for 1997

Data: Centre for Disease Control, THS

Invasive pneumococcal disease

Streptococcus pneumoniae can cause a variety of illnesses, the most serious of which are pneumonia, septicaemia and meningitis. These three conditions are termed 'invasive pneumococcal disease'.

8.10 NT invasive pneumococcal disease notification rates 1993 to 1997



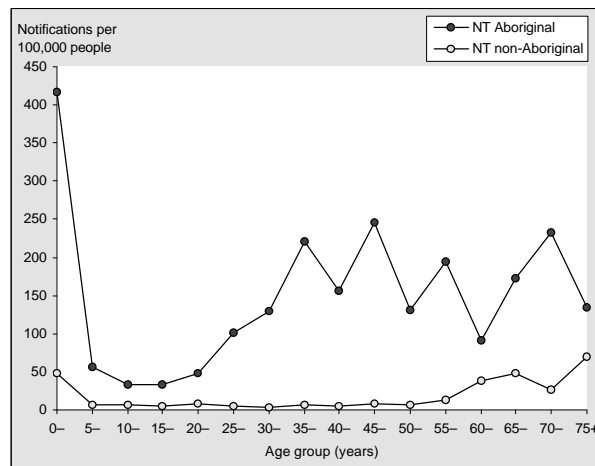
Data: Centre for Disease Control, THS

436 cases of invasive pneumococcal disease were reported in the NT from 1993 to 1997. In 1993, the rate of invasive pneumococcal disease in NT Aboriginal people was 21 times higher than in non-Aboriginal people. In 1995–96, the NT Government funded a mass pneumococcal vaccination program and over 5,600 doses of pneumococcal vaccine were administered to groups considered 'at risk' by National Health and Medical Research Council criteria (NHMRC 1997). The notification rate in Aboriginal people fell from 168 per 100,000 in 1995 to 104 in 1997 and continued to fall in 1998, but remained six times higher than the non-Aboriginal rate (graph 8.10).

Aboriginal children under five years of age experience the highest rates of disease (graph 8.11). Rates are lower in older children and teenagers, but increase again after age 20 years and are very high at all ages over 25 years.

In the years 1993 to 1997 there were 41 deaths attributed to invasive pneumococcal disease in the NT. 32 (78%) of these deaths were of Aboriginal people. Five deaths occurred in children aged 0–4 years. In 1994, the death rate for Aboriginal people was over ten times higher than the non-Aboriginal rate, but by 1997 had fallen by approximately 30%. The highest age-specific mortality rates of 40 per

8.11 NT invasive pneumococcal disease, age-specific rates 1993 to 1997



Note: Age-specific notification rates per 100,000 people

Data: Centre for Disease Control, THS

100,000 occur in Aboriginal men aged 35–39 and Aboriginal women aged 55–59 (Centre for Disease Control, unpublished).

Of the total 436 cases of invasive pneumococcal disease in the years 1993 to 1997, 56% were notified from the Alice Springs district, and 26% and 11% from Darwin and Katherine districts respectively.

Gastrointestinal diseases

The most common gastrointestinal infectious diseases in the NT are campylobacteriosis, rotavirus infection in children, salmonellosis and shigellosis. Nausea, vomiting and diarrhoea are the predominant symptoms in those infected. They are all spread by ingesting the bacteria or virus, usually in contaminated food or water or other fluid.

8.12 Gastrointestinal disease notifications 1997

Disease	Northern Territory		Australia
	No.	Rate	Rate
Campylobacteriosis	206	110.1	96.7
Hepatitis A	92	49.2	16.6
Salmonellosis	347	185.4	37.8
Shigellosis	169	90.3	6.5

Notes: Notification rate per 100,000 people

Source: O'Brien 1999

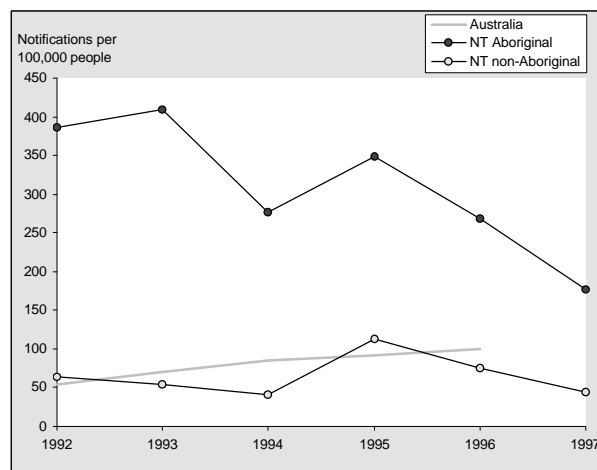
The NT experiences the highest rates of gastrointestinal disease in Australia. This is true of both rural and urban areas in the NT and across all health districts. Aboriginal people experience much higher rates of all gastrointestinal infections. The

underlying causes of these infections in the NT include poor environmental, domestic and personal hygiene. The contribution of food and water borne outbreaks to the risk of gastrointestinal disease is currently unknown but is felt to be low as very few single-source outbreaks have been identified.

A surprisingly high percentage of cases of campylobacteriosis and salmonellosis occur in infants under six months of age in the NT, with cases occurring as early as the first month of life.

Campylobacteriosis

8.13 Campylobacteriosis notification rates 1992 to 1997



Note: Australian data not available for 1997

Data: Centre for Disease Control, THS

Notifications of campylobacteriosis declined in the NT between 1993 and 1997, for both Aboriginal and non-Aboriginal people (graph 8.13). Overall, Territorians experienced 1.4 times the national rate of campylobacteriosis in 1996 (144 versus 100 per 100,000); however non-Aboriginal rates were actually lower than the national rate. Campylobacteriosis does not follow a seasonal pattern—cases occur with similar frequency throughout the year.

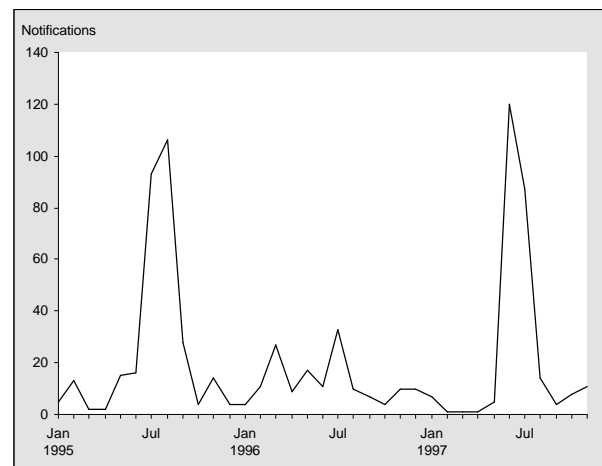
Campylobacter infections are far more common in pre-school children than in older age groups. The age-specific notification rate among Aboriginal children aged 0–4 years in 1996 was 1,900 per 100,000; this is seven times the rate in non-Aboriginal children of the same age (265 per 100,000). The non-Aboriginal rate was similar to the national rate for this age group. Eight percent of cases occurred in infants under six months of age and 90% of cases were 28 months or younger. Of 122 people admitted to NT public hospitals for campylobacteriosis in 1996, 29% were infants under twelve months of age, 94% were under

age five, and 95% were Aboriginal (Centre for Disease Control, unpublished).

Rotavirus infection

Human rotavirus occurs worldwide and is the most common cause of diarrhoea in infants under two years of age. Spread of infection within families, institutions and childcare centres is common. In 1996, 17% of rotavirus cases occurred in infants under six months of age and 90% of cases were infants 27 months or younger. The average age at notification in the under five-year-olds was 13 months for Aboriginal and 18 months for non-Aboriginal children.

8.14 NT rotavirus notifications, children under five years 1995 to 1997



Note: Number of notifications per month

Data: Centre for Disease Control, THS

As in other parts of Australia, outbreaks of rotavirus in the NT tend to occur during the cooler months in the middle of the year. An NT-wide outbreak occurred in 1995 (graph 8.14).

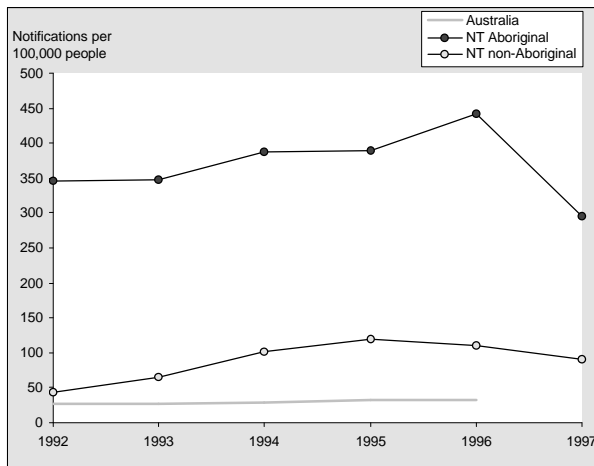
The incidence of rotavirus infections in the NT based on hospital admissions in 1993–1996 was three to five times higher than other States (Carlin 1998).

Salmonellosis

Salmonellosis is one of the most important food borne causes of gastroenteritis in Australia. Poultry, livestock, reptiles and pets may all act as reservoirs of infection.

In 1996, the NT rate of salmonellosis infection was 232 per 100,000, compared to the national rate of only 32 per 100,000. The NT Aboriginal rate was 14 times higher than the national rate, and the non-

8.15 Salmonellosis notification rates 1992 to 1997



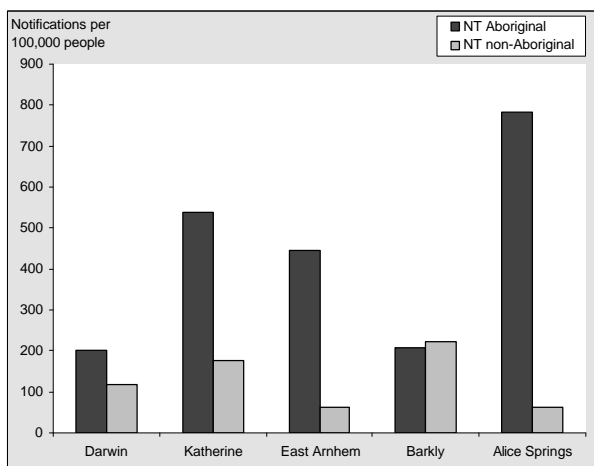
Note: Australian data not available for 1997

Data: Centre for Disease Control, THS

Aboriginal rate four times higher. In 1997 notifications of salmonellosis reached the lowest level the NT has experienced since 1992 (187 per 100,000). This downward trend was predominantly due to a decrease in notifications in Aboriginal people (graph 8.15).

In the years 1992 to 1996 there was a seasonal pattern to salmonellosis infections in the NT, with more cases occurring in the first half of each year (data not shown).

8.16 Salmonellosis notification rates by district 1996



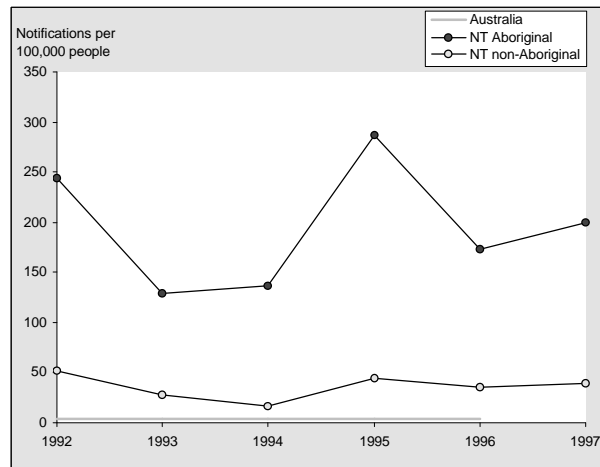
Data: Centre for Disease Control, THS

Alice Springs district reported the highest rate of salmonellosis in 1996 of over 780 per 100,000 in Aboriginal people (graph 8.16).

Shigellosis

Shigellosis is a highly infectious form of gastroenteritis that spreads readily among members of the same household via food or fluids contaminated with faecal material. Only very small amounts of contamination are required to transmit shigellosis—illness can occur after ingestion of as few as ten bacteria. It may be a severe, sometimes fatal, illness with bloody diarrhoea and toxic effects throughout the body, although in most cases it requires only supportive treatment such as maintaining fluid intake.

8.17 Shigellosis notification rates 1992 to 1997



Note: Australian data not available for 1997

Data: Centre for Disease Control, THS

The NT has the highest rate of shigellosis in Australia. Overall, Territorians experienced over 20 times the national rate of shigellosis in 1996 (82 versus 4 cases per 100,000). The rate for Aboriginal people was higher than the non-Aboriginal rate, but both were much higher than the Australian rate (graph 8.17).

Children aged 0–4 years experience the highest rates of disease from shigellosis. In 1996, 60% of cases were children aged under ten years. The age-specific notification rate among Aboriginal children aged 0–4 years in 1996 was 806 per 100,000; this is nine times the rate in non-Aboriginal children of the same age (92 per 100,000). The non-Aboriginal rate was lower than the national rate for this age group. In 1996 no cases of shigellosis occurred in infants under 6 months of age but 90% of cases were children aged 7–40 months. In older age groups, rates were somewhat higher in the 25–34 year age range, which may be due to transmission from infected children to their parents (Centre for Disease Control, unpublished).

In 1996 there were 86 people treated in hospital for shigellosis, of whom 9% were aged under twelve

months of age and 66% were under age five; 83% were Aboriginal. Aboriginal patients required considerably longer hospital treatment; the average length of stay for Aboriginal people was nine days, compared to four days for non-Aboriginal people. Alice Springs district reported the highest rate of shigellosis in 1996, 190 per 100,000 for Aboriginal and non-Aboriginal people combined (Centre for Disease Control, unpublished).

Hepatitis A (HAV)

In many remote NT Aboriginal communities almost all people are infected with HAV during early childhood, when the infection causes very mild or no illness at all (Bowden and others 1994). It is usually not recognised as HAV infection. HAV produces long-term immunity—people can only be infected with HAV once, so Aboriginal people infected as children will never get HAV infection again. Thus most notified HAV cases are in adults in whom HAV causes a more serious illness. Childhood infection with HAV is very uncommon in non-Aboriginal people, and since most Aboriginal people have been infected and become immune in childhood, recognised cases of HAV are mostly non-Aboriginal adults.

In the years 1992 to 1997 there were 559 cases of HAV notified in the NT. An outbreak occurred in late 1992 when 157 cases were notified. The number of cases per year was lowest in 1995, but increased in 1996 and 1997. In 1996 the NT HAV notification rate was over three times higher than the national rate (42 per 100,000). However, notified cases grossly underestimate the occurrence of HAV infection in Aboriginal remote communities, especially in early childhood when infection occurs without causing illness (Centre for Disease Control, unpublished).

In 1996, 33 people were admitted to hospital with HAV, of whom 36% were under five years of age and 39% were aged 20–39 years; 55% were non-Aboriginal. Between 1992 and 1997 there were no deaths attributed to hepatitis A (Centre for Disease Control, unpublished).

Vector borne diseases

Malaria and dengue fever are not transmitted by mosquitoes in the NT. People diagnosed with these diseases have been infected elsewhere before travelling to the NT. Other arboviruses (including Ross River virus, the most common NT arbovirus infection)

8.18 NT mosquito borne disease notifications 1992 to 1997

Disease	Other		Ross River		Total
	Arbovirus	Dengue	Malaria	virus	
1992	57	11	30	237	335
1993	25	4	30	247	306
1994	34	6	41	315	396
1995	14	8	36	387	445
1996	28	6	26	131	191
1997	44	7	38	222	311
Total	202	42	201	1,539	1,984

Data: Centre for Disease Control, THS

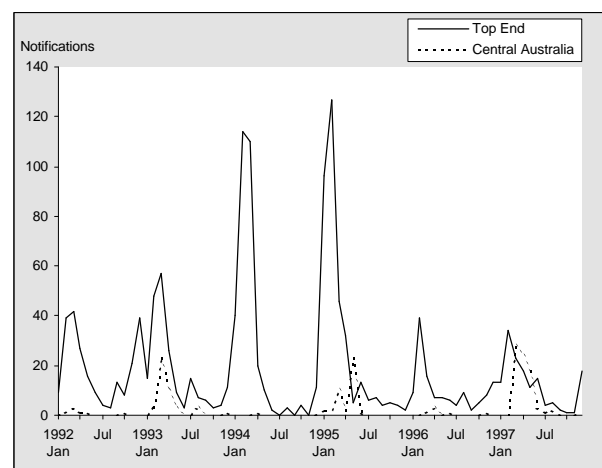
are transmitted in the NT and as a group are the most common mosquito borne diseases that occur in the NT (table 8.18).

Mosquito borne diseases transmitted in the NT

The most important disease transmitted by mosquitoes in Australia is Ross River virus (RRV), one of several viruses that cause epidemic polyarthritis with or without fever and rash. Barmah Forest virus (BFV) belongs to the same family of viruses as RRV and causes a similar illness. RRV and BFV are rarely reported in Aboriginal people.

The vast majority of RRV infections occur in the Top

8.19 NT Ross River virus disease notifications 1992 to 1997

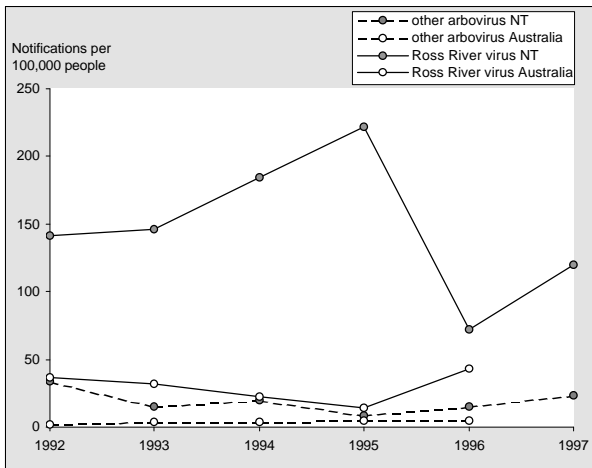


Notes: Number of notifications per month
'Top End' includes Katherine district

Data: Centre for Disease Control, THS

End of the NT during the Wet Season (January to April), with cases occurring in Central Australia during particularly wet seasons (graph 8.19).

8.20 NT mosquito borne virus notification rates 1992–1997

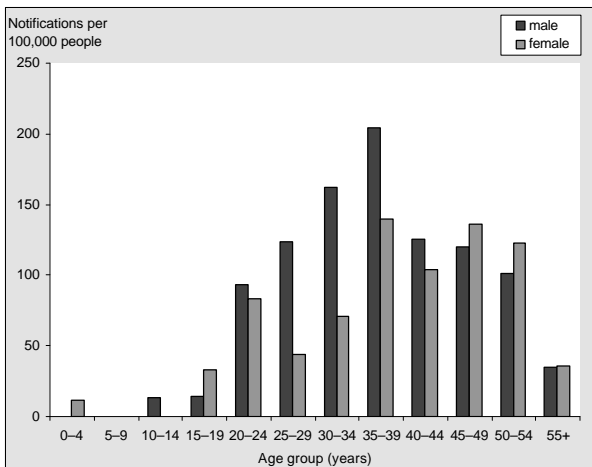


Note: 'Other arboviruses' consists mostly of Barmah Forest Virus, but also includes small numbers of other viruses such as Kunjin and Australian Encephalitis

Data: Centre for Disease Control, THS

The notification rate for RRV in 1996 was the lowest since 1992 although it remained 3.2 times higher than the national rate (graph 8.20). An outbreak of BFV occurred in the East Arnhem district in 1992 concurrent with the seasonal peak of RRV activity.

8.21 NT Ross River virus notification rates by age group 1996



Note: Age-specific notification rates per 100,000 people

Data: Centre for Disease Control, THS

Ross River virus infection is most common in adults aged 20–54 years, and thus has considerable impact on the work force (graph 8.21). Ross River virus infection in children often does not cause a significant illness, and is not diagnosed and notified. The lower notification rates in people over age 54 may be because of higher immunity to RRV among older people, less outdoor activity and thus less exposure to mosquitoes, or failure to diagnose the illness.

Mosquito borne diseases not transmitted in the NT

Malaria and dengue fever are mosquito borne diseases which do not occur naturally in the NT. Dengue fever occurs in northern Queensland and South-East Asia, but the *Aedes* mosquito which transmits the dengue virus does not occur in the NT. Very active surveillance is maintained to prevent the introduction of the *Aedes* species to the NT. Several cases of dengue are diagnosed each year in people who have been infected elsewhere, mostly Indonesia and Thailand, before travelling to the NT. In the years 1992 to 1997 four people with dengue required hospital treatment, with no deaths (Centre for Disease Control, unpublished).

The mosquito species which carries malaria (*Anopheles*) is present in the NT, and malaria could become re-established in the NT if local mosquitoes acquired the malaria parasite from people infected with malaria arriving from overseas. Active surveillance and early case detection and treatment are carried out in the NT to prevent the reintroduction of malaria. Each year 30–40 cases of malaria are diagnosed in people entering the NT from overseas. Most cases are infected in Papua New Guinea and Indonesia and are usually cases of *Plasmodium vivax* or *Plasmodium falciparum* (Dyer 1998).

In the years 1992 to 1997 there were 181 hospital admissions for malaria. 63% were NT residents returning home from malaria endemic areas, 27% were overseas travellers and 10% were residents of other Australian states (Centre for Disease Control, unpublished).

Rheumatic fever

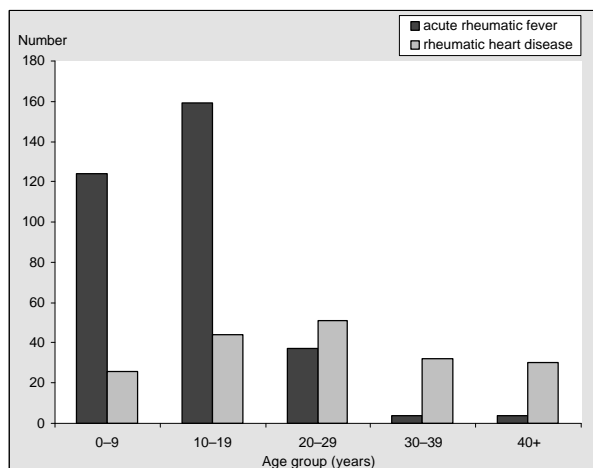
Acute rheumatic fever (ARF) is an illness which occurs in some people shortly after they recover from a infection with the bacteria *Streptococcus pyogenes*. It causes fever and skin rash, and can affect the joints, heart valves, and brain. Repeated attacks can cause serious damage to the heart valves, called rheumatic heart disease (RHD).

Rheumatic fever is a disease of poverty, occurring most commonly in over-crowded conditions, where poor hygiene and nutrition make infectious disease a common occurrence, and streptococcal infections are not treated early enough because of poor access to health care. Although common in the last century, it is now very rare in Australia, except among Aboriginal

Australians who have amongst the highest rates of acute rheumatic fever reported anywhere in the world (Carapetis & others 1996).

Though it is a notifiable disease, complete statistics are not available for the entire NT, but have become available for the Top End (Darwin, Katherine and East Arnhem districts) since the establishment of the Top End Rheumatic Fever Control Program.

8.22 First episodes of ARF and RHD*



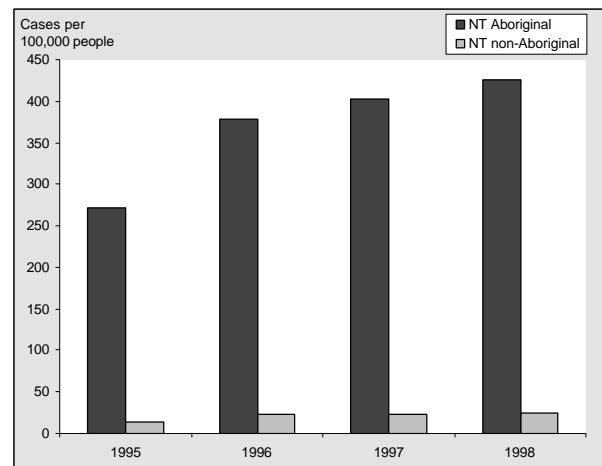
Notes: ARF - acute rheumatic fever
RHD - rheumatic heart disease
Age is recorded at the time of the first known episode of ARF or RHD for each person on the register of the Top End Rheumatic Fever Control Program
*RHD includes only people with no prior diagnosis of ARF

Data: Centre for Disease Control, THS

Acute rheumatic fever is most common in children, although it does occur in young adults. Some people, often in adulthood, are found to have rheumatic heart disease without any record of having previously had acute rheumatic fever – presumably these people previously suffered a mild case of acute rheumatic fever which was not recognised as such at the time (graph 8.22). Of those people with a documented episode of acute rheumatic fever, 86% of first episodes occurred before age 20. Approximately 45% of cases of acute rheumatic fever are repeat episodes (Carapetis & others 1996).

In each of the past five years between 15 and 25 people were diagnosed with their first episode of acute rheumatic fever. The prevalence of rheumatic heart disease is much higher in Aboriginal people than in non-Aboriginal people. In 1998, the prevalence in Aboriginal people (426 cases per 100,000) was 17 times higher than that in non-Aboriginal people (25 per 100,000) (graph 8.23).

8.23 Top End rheumatic heart disease prevalence



Note: The number of cases of rheumatic heart disease recorded on the Top End Register at 1 October each year.

Data: Centre for Disease Control, THS

Melioidosis

Melioidosis is an infectious disease caused by the bacterium *Burkholderia pseudomallei*, which lives in soils and muddy water in the Top End of the NT. Most infections are thought to be acquired when the bacteria invade the body through the skin. The commonest type of infection is pneumonia, but it may also cause skin abscesses or ulcers, abscesses in the prostate, spleen, kidney, liver and other organs, septicaemia, and unusual neurological illnesses.

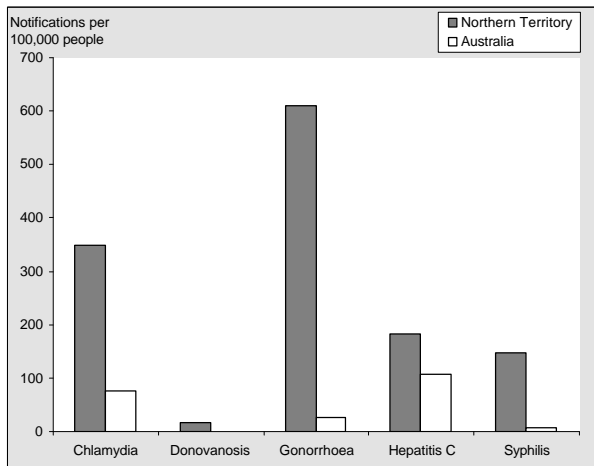
Melioidosis is more common in the elderly, diabetics, those who consume alcohol or kava excessively, and people with kidney failure or chronic lung disease. Most people with melioidosis have one of these risk factors, although it can occasionally occur in otherwise healthy people.

In the nine years since October 1989, there were over 260 cases diagnosed in the Top End of the NT, with 206 cases confirmed by culture and 43 deaths (21% of cases). The average annual incidence in those years was 16.5 cases per 100,000 people, but in heavier Wet seasons the incidence increases, with the incidence in the record Wet season of 1997–1998 being 34.5 per 100,000, with 45 confirmed cases, of whom 4 died (Currie & others 1999a, 1999b).

The incidence in the Top End is much higher than in another recognised high risk area for melioidosis in north-east Thailand, where the average annual incidence is 4.4 per 100,000.

Sexually transmitted diseases and blood borne viruses

8.24 Selected STDs, notification rates 1997



Source: O'Brien 1999

8.25 Selected STDs, notifications 1997

	Northern Territory		Australia
	No.	Rate	Rate
Chlamydia	655	350	75
Donovanosis	31	17	0.4
Gonorrhoea	1143	611	25
Hepatitis C	341	182	106
Syphilis	273	146	7

Note: Notification rate per 100,000 people

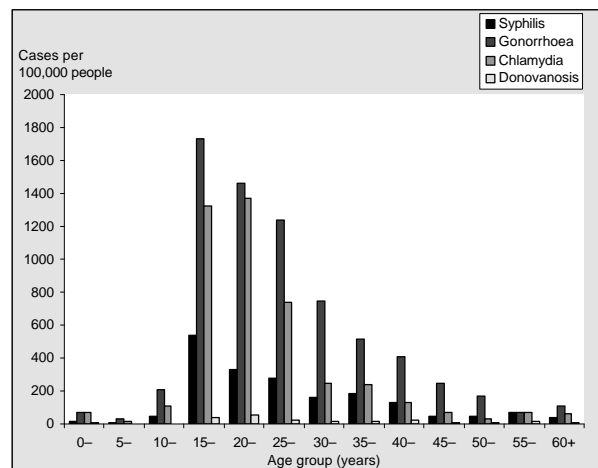
Source: O'Brien 1999

Sexually transmitted diseases (STDs) and blood borne viruses (BBV) remain a major but largely unrecognised health problem in the Northern Territory. Chlamydia, gonorrhoea, syphilis and donovanosis are much more common in the NT than in other states (graph 8.24, table 8.25). HIV and AIDS occur at approximately the same rate in the NT as in most

other parts of Australia, although rates are considerably higher in the inner urban areas of Sydney and Melbourne. Accurate data are not available on the incidence of genital herpes, genital warts, trichomoniasis or hepatitis C infections.

Many people infected with an STD have few or no symptoms at the time of their initial infection, and will thus delay, or do not seek, medical treatment. They are able to spread the infection to other people before they are treated. Although many STDs cause little obvious damage initially, they can cause serious long-term problems (table 8.26).

8.27 NT STD notification rates by age 1997



Note: Age-specific notification rates per 100,000 people

Data: Centre for Disease Control, THS

STDs are most common among young adults. Rates of syphilis, gonorrhoea and chlamydia are highest in people aged 15–29 (graph 8.27). Strategies to control

8.26 Long-term effects of STDs

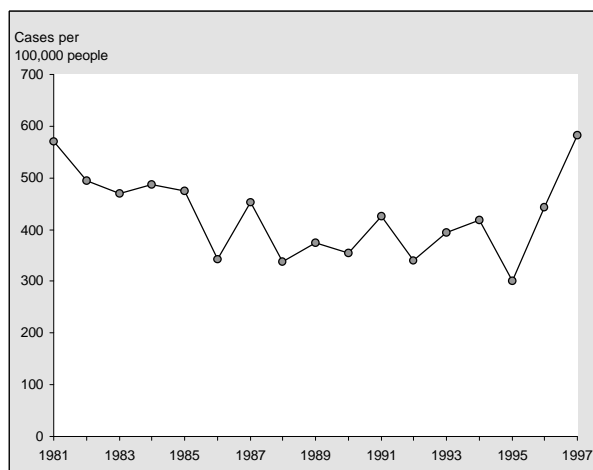
Complication	Infection
Pelvic infection in women, ectopic pregnancy (can be fatal) and infertility	Chlamydia, gonorrhoea
Miscarriage, prematurity and small babies (can be fatal)	Syphilis, trichomoniasis, chlamydia, gonorrhoea
Congenital syphilis, which may cause a variety of illnesses in an infected baby	Syphilis (in the mother during pregnancy)
Herpes of the brain, eye or skin in babies (may be fatal)	Genital herpes (in the mother at the time of childbirth)
Conjunctivitis, pneumonia, congenital syphilis and herpes in babies (can be fatal)	Chlamydia, gonorrhoea, herpes, syphilis
Cervical cancer (can be fatal)	Wart virus infection
Genital deformities	Donovanosis
Recurring genital ulcers, meningitis	Genital herpes
Liver disease and liver cancer (can be fatal)	Hepatitis B, hepatitis C
AIDS (can be fatal)	HIV
Increased spread of HIV	Syphilis, herpes, chlamydia, gonorrhoea, trichomoniasis, donovanosis

the spread of STDs must obviously aim at people in their mid-teens and early twenties.

Gonorrhoea and chlamydia

Gonorrhoea and chlamydia are bacterial infections of the urethra in men (the tube through which urine passes out from the bladder) and the urethra and cervix in women. They may cause a discharge from the vagina or urethra and stinging when passing urine, but very often go unnoticed. If untreated these infections may damage the uterus in women and the testes in men, sometimes causing infertility.

8.28 NT gonorrhoea notification rates 1981 to 1997



Data: Centre for Disease Control, THS

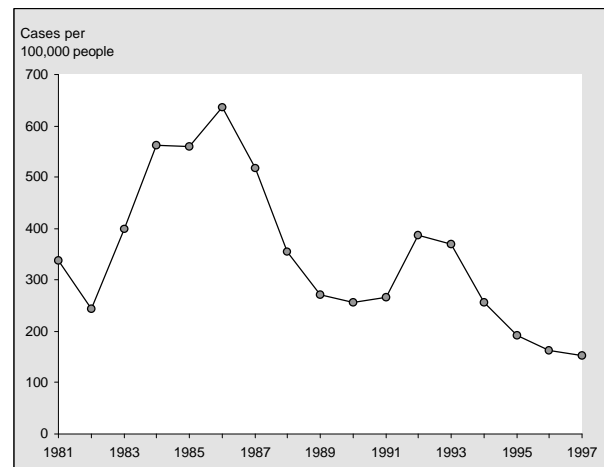
There was a slow but steady fall in the number of gonorrhoea notifications between the years 1981 and 1995, but then a sudden increase over the following two years (graph 8.28). This increase is most likely due to an increase in detection of cases since the introduction of more sensitive testing procedures (the PCR laboratory test) and easier methods of specimen collection (using tampons in women and urine in men), rather than to an increase in the prevalence of gonorrhoea.

Syphilis

Syphilis is a bacterial infection which initially causes a painless ulcer at the site of infection. If untreated, this ulcer heals, but the bacteria invade deeper into the body and some weeks later cause a mild illness which includes fever and a skin rash. If still untreated, syphilis in some people continues to slowly damage the brain, heart and blood vessels, but the damage caused may not be apparent for many years.

Untreated syphilis in pregnant women can also be transmitted to the baby and cause physical deformities and brain damage.

8.29 NT syphilis notification rates 1981 to 1997



Data: Centre for Disease Control, THS

Syphilis notification rates fell considerably over the years 1994 to 1997 (graph 8.29). This may reflect a true decrease in syphilis infections due to increased diagnosis and treatment. It may also be due to the widespread antibiotic use for other infections which has the fortunate secondary effect of treating undiagnosed cases of syphilis.

Donovanosis

This uncommon STD causes painful genital ulcers which slowly enlarge and can permanently destroy infected parts of the genitals. Donovanosis is usually seen in people who are socially and economically disadvantaged. This is the case in the NT where it is found almost exclusively in Aboriginal people.

Trichomoniasis ('Trike')

This STD has been considered to be a nuisance up until fairly recently. In some infected people it causes pain on urination and discharge similar to chlamydia, but most people are unaware that they have it. More importantly it is now known that trike infection causes prematurity and affects the growth of babies prior to birth. It is easy to treat with antibiotics and it is most important that pregnant women be tested for it.

Genital herpes and genital warts

These are two very common viral infections. The herpes virus (herpes simplex virus) may cause painful

genital blisters and ulcers (sores). The wart virus (human papilloma virus) causes painless genital lumps which range in size and shape. Wart virus infection is regarded as a cause of cancer of the cervix.

There is no cure for either condition, but the symptoms can be controlled. Painful recurrent herpes can be suppressed with regular medication, unattractive warts can be removed by surgery, freezing, burning or the application of “anti-wart” paints.

HIV and hepatitis C

These are viral infections which are spread by contact with infected body fluids. Hepatitis C virus is usually spread through injecting drug use (ie, transmitted in blood), and is not regarded as an STD. HIV can be spread through sexual intercourse and injecting drug use. People infected with these viruses often remain quite healthy for many years, before eventually developing AIDS (a progressive deficiency of the immune system) in the case of HIV infection, or chronic liver damage in the case of hepatitis C.

Why is it different in the Territory?

The rates of most sexually transmitted infections are higher in the NT than elsewhere in Australia. STDs are more common in the NT because:

- the NT population is much younger than that of the rest of Australia, and STDs are much more common in young adults than older people
- NT people living in remote areas do not have ready access to GPs and specialised sexual health services, and may have little choice about the health professional they can see—concerns about confidentiality may cause them not to seek treatment for sexual health problems. Untreated infections can be spread to others
- The mobility of NT residents has an impact on their behaviour. People are often isolated, separated from family and friends and may take greater risks in their behaviour as a result
- NT residents have a very diverse cultural background. Many people do not speak English as their first language, nor are they fluent in reading English. This reduces their opportunity to receive health education messages

However, the higher STD rates are probably partly due to greater detection and notification of cases in the NT because:

- testing for STDs is now being offered as part of regular health checks in many remote

communities, so that more STDs are now being diagnosed and treated. Screening such as this is not offered throughout the rest of the country

- locally developed laboratory test methods, with more ‘user-friendly’ collection of specimens (using tampons and urine samples) detect more cases than in other parts of Australia where these methods are not yet widely used
- the notification system in the NT is more reliable than in other parts of Australia, particularly because of direct notification from NT pathology laboratories

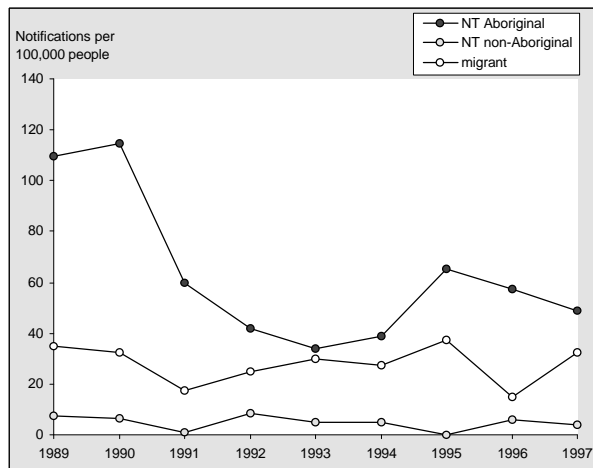
Tuberculosis

Tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis* or *Mycobacterium bovis*. It usually causes disease in the lungs (pulmonary tuberculosis), although it can also infect other parts of the body. In most people, the body’s immune system controls the infection before it causes serious damage. The infection remains dormant in the lungs or other infected parts for life. In about 10% of infected people re-activation occurs many years later when other health problems (such as malnutrition, injury, alcoholism or drug abuse, chronic diseases such as diabetes or other infections such as HIV) weaken the body’s immune defences and allow the tuberculosis bacteria to multiply and spread.

TB continues to be the leading cause of death in the world from a single infectious agent. In parts of the developed world, the steady decline in the incidence of TB over the past century has recently ceased or even reversed. The resurgence has been attributed to a combination of the HIV epidemic, immigration from countries where infection is common, the development of antibiotic resistant strains of TB, rising poverty, homelessness and overcrowding among urban populations and the deterioration of TB control programs. Recent Australian surveillance data suggest that this country is not experiencing the resurgence of TB noted elsewhere. The Australian notification rates for the early–mid 1990s has been stable at approximately 5.5 cases per 100,000 population. Additionally Australia has low rates of drug resistant tuberculosis (Dawson 1999).

The NT has always had rates of TB higher than the rest of Australia. In the late 1980s TB incidence in the NT was eight to nine times higher than the national rate. In the early 1990s the rate dropped to an average of 19 per 100,000, or three to four times the national rate, and has remained relatively stable since then,

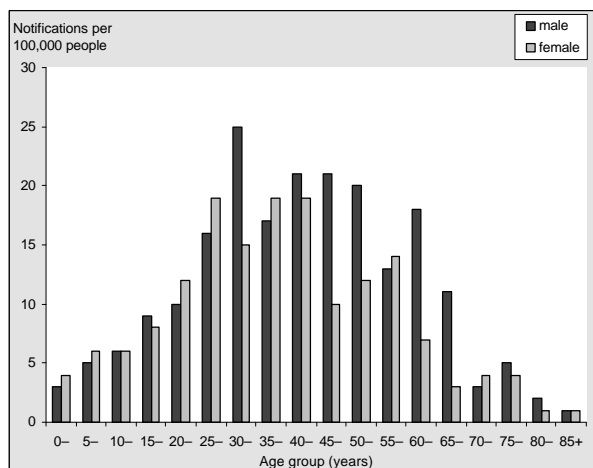
8.30 NT tuberculosis notification rates 1989 to 1997



Data: Centre for Disease Control, THS

with approximately 30 to 40 cases diagnosed each year. Aboriginal and migrant people have relatively high rates of TB (graph 8.30). Many of the migrants come from countries known to have an extremely high incidence of TB, such as Indonesia, East Timor, Vietnam, China, the Philippines and Papua New Guinea.

8.31 NT tuberculosis notifications by age 1989 to 1997



Note: Age-specific notification rates per 100,000 people

Data: Centre for Disease Control, THS

In the period 1989 to 1997 there were a total of 361 cases of TB notified in the NT: 55% were male and 60% were Aboriginal. 86% of these cases occurred in the Top End. The highest incidence rates were in the ages 25 to 54 (graph 8.31). The average age was 40 years for females and 46 years for males. The three major risk factors for TB in cases diagnosed in the NT are being a close contact of another person with TB, alcoholism, and malnutrition.

Territory Health Services provides an active TB control service, with TB Control Units in Darwin, Alice Springs, Katherine and East Arnhem. The priorities of this service are:

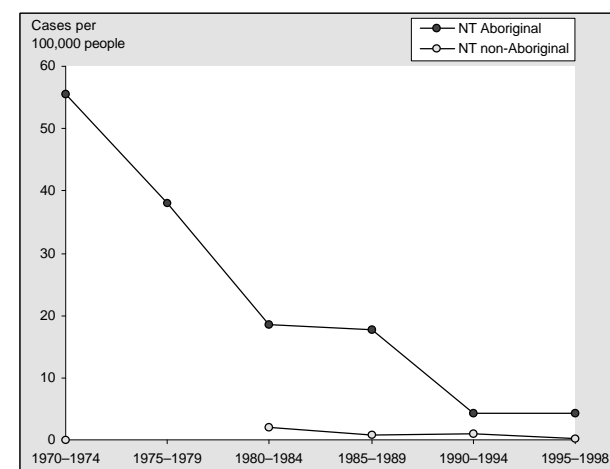
- treatment of patients
- appropriate screening, contact tracing and preventive therapy
- education of health staff and at-risk groups

Patient treatment uses the Directly Observed Therapy short course (DOTS) regimen, as recommended by the World Health Organisation. This requires direct supervision of treatment for at least six months, with medication provided free by Territory Health Services. In the decade to 1999 there were no cases of multi-drug resistant TB, and the cure rate of TB patients was almost 100%.

Leprosy

Leprosy is a bacterial infection caused by the organism *Mycobacterium leprae*. The main damage caused by leprosy is to the peripheral nerves, particularly in the skin and limbs. It is usually a very slowly progressive infection, taking many years to gradually destroy the nerves. Once sensation is lost due to nerve damage, frequent injuries to the skin and limbs, and slow healing, cause chronic ulcers and infections which may lead to amputation of digits or parts of limbs. Contrary to common belief in previous times, leprosy is not easily transmitted from person to person, and most commonly infects family members or other people in close contact with an infected person.

8.32 NT leprosy incidence 1970 to 1998



Note: Data for non-Aboriginal and all Territorians is not available for 1974 to 1979 due to the unstable population following 1974 cyclone.

Data: Centre for Disease Control, THS

In the NT, active case finding and treatment for leprosy began in the early 1950s, and has brought about a marked reduction in the incidence of leprosy. Rates for leprosy in Aboriginal people have fallen steadily from 56 per 100,000 annually over the period 1970–1974, to 38 per 100,000 annually over 1980–1984, to 4 per 100,000 annually over 1994–1998 (graph 8.32).

A total of 1,467 cases had been notified in the NT up until 1994. Of these, 91% of cases occurred in Aboriginal people, 4% in Europeans, 3% in Chinese, 1% in South-East Asians and 1% in those from other countries (including Papua New Guinea).

In the years 1970 to 1994, following the introduction of multiple drug therapy (MDT) and with a more sensitive case definition, there were 224 new notifications of leprosy. Of these 193 (86%) were Aboriginal, and 19 (8%) were non-Aboriginals who acquired the disease locally. The 12 (5%) remaining cases were from leprosy endemic areas of South-East Asia and Papua New Guinea. Of these, 62% were male. The average age at diagnosis for Aboriginal people was 36 years compared with 49 years for non-Aboriginal people acquiring their disease in Australia (Lush & Hargrave 1995). In the years 1994 to 1998 there were a further nine notifications of leprosy, eight of whom are Aboriginal people (Centre for Disease Control, unpublished).

Leprosy is now a rare disease in the NT and therefore widespread active case finding is no longer a cost-effective option. The main objectives for leprosy control are:

- to ensure early case detection by maintaining awareness of the disease amongst health staff and the community
- to treat all patients until cured (six months to two years, depending on the type of leprosy)
- to follow up all contacts of leprosy patients
- to follow up all past leprosy patients for life: to detect relapse and prevent and treat deformity

References

- Bowden FJ and others 1994, 'Should Aboriginals in the Top End of the Northern Territory be vaccinated against hepatitis A?' *Med J Aust*, vol 161, pp372–3.
- Carlin JB and others 1998, 'Rotavirus infection and rates of hospitalisation for acute gastroenteritis in young children in Australia, 1993–1996', *Med J Aust*, vol 169, pp252–6.
- Carapetis JR, Wolff DR & Currie BJ 1996, 'Acute rheumatic fever and rheumatic heart disease in the Top End of the Northern Territory', *Med J Aust*, vol 164, pp146–9.

- Currie BJ and others 1999a, 'A nine year prospective study of melioidosis from the Top End of the Northern Territory', *Aust NZ J Med* (in press).
- Currie BJ and others 1999b, 'The epidemiology of melioidosis in Australia and Papua New Guinea', *Acta Tropica* (in press).
- Dawson D 1999, 'Tuberculosis in Australia: bacteriologically confirmed cases and drug resistance, 1997', *Commun Dis Intell* (in press)
- Dyer M 1998, 'Malaria - some epidemiological data', *NT Dis Cont Bull*, vol 5, no 3, pp16–17.
- Hanna J, Macintyre A, Worswick D & Burrell C 1989, 'Seroconversion after administration of measles vaccine to central Australian Aboriginal children at nine months of age', *Med J Aust* vol 150, pp188–190.
- Hanna J 1990, 'The epidemiology of invasive *Haemophilus influenzae* infections in children under five years of age in the Northern Territory: a three year study', *Med J Aust*, vol 152, pp235–40.
- Hanna J 1992, 'The epidemiology and prevention of *Haemophilus influenzae* infections in Australian Aboriginal children', *J Paed Child Health*, vol 28, pp354–61.
- HIC 1999, *Immunisation: coverage*, Health Insurance Commission website (www1.hic.gov.au/general/acircirgtb04).
- Lush D, Maloney M & Merianos A 1994, 'Measles outbreak in the Alice Springs region, Northern Territory, June to October 1994', *Commun Dis Intell* vol 18, pp597–8.
- Lush D & Hargrave J 1995, *Leprosy: 1970–1994 in the Northern Territory*, Abstracts of the combined scientific meeting of the Australasian Faculty of Public Health Medicine 1995, pp20–23.
- Markey P 1998, 'The effect of conjugate Hib vaccines on the incidence of invasive Hib disease in the NT', *NT Dis Cont Bull*, vol 5, no 1, pp3–6.
- Miller N 1998, 'Changes to the Northern Territory childhood vaccination schedule: MMR', *NT Dis Cont Bull* vol 5, no 3, pp1–2.
- Mortimer EA Jr 1990, 'Perspective. Pertussis and its prevention: a family affair', *J Infect Dis*, vol 161, pp473–9.
- NHMRC 1997, *The Australian Immunisation Handbook (6th ed)*, Australian Government Publishing Service, Canberra, pp 138–41.
- O'Brien E and others 1999, 'Australia's notifiable diseases status 1997', *Commun Dis Intell*, vol 23, no 1, pp1–22.
- THS 1999, *Communicable Disease Surveillance in the Northern Territory: Guidelines for the Reporting of Notifiable Conditions*, Centre for Disease Control, Territory Health Services, Darwin (in print).

Injury and violence

by Sandra Thompson, Karen Dempsey and Michael Pearce

Injury is a major cause of death and illness in Australia. However, the NT has a greater burden of injury than other states, and Aboriginal Territorians are at particularly high risk of dying or being hospitalised from an injury.

What is injury?

Injury encompasses physical harm or damage due to road transport accidents, sports, drowning, burns, falls, suffocation, violence, homicide and suicide. Injury and poisoning are often combined into one category for the reporting of statistical information. In this chapter, the term 'injury' refers to both injury and poisoning, although poisoning is only a very small proportion of injury admissions to hospital (less than 2%) and of injury deaths (0.06%) in the NT (Epidemiology Branch, THS).

The burden of injury: death and illness

Deaths caused by injury

9.1 Injury deaths 1979 to 1995

	No.	%	Rank
Male			
NT Aboriginal	639	19.1	2
NT non-Aboriginal	1,030	27.7	1
Australia	93,422	8.7	3
Female			
NT Aboriginal	253	9.8	4
NT non-Aboriginal	235	15.6	3
Australia	39,365	4.3	4

Notes: '%' is the percentage of deaths attributable to injury
 'Rank' is the position of injury among other causes of death, including circulatory disease, respiratory disease, cancer and digestive disease

Data: Epidemiology Branch, THS

Between 1979 and 1995 (table 9.1), injury was the:

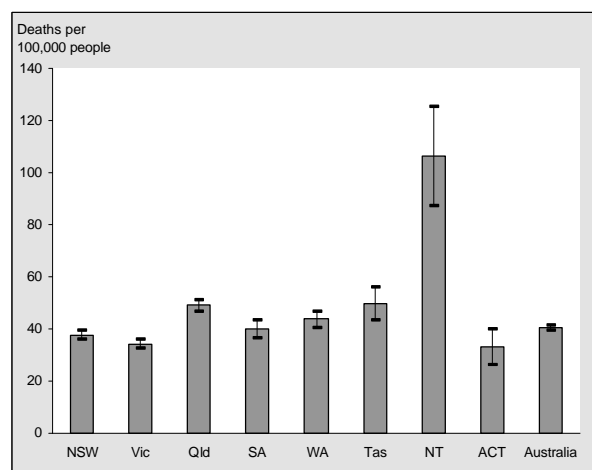
- most frequent cause of death for NT non-Aboriginal males (28%)
- second-highest cause of death for NT Aboriginal males (19%)
- third-highest cause of death for NT non-Aboriginal

females (16%) and for Australian males overall (9%)

- fourth-highest cause of death for NT Aboriginal females (10%) and for Australian females overall (4%)
- most common cause of death for NT children aged one to 14 (d'Espaignet & others 1998)

Caution should be exercised when interpreting trends, particularly for specific causes of injury. Because of the small population of the NT, the absolute number of injury deaths is small, despite the high injury death rate per 100,000 people. Over the 17 years to 1995, the NT had 2,157 injury deaths out of a total 11,155 deaths. An average of 656 deaths occurred in the Territory each year, of which 127 were due to injury (Dempsey & Condon 1999). The ratio of male to female injury deaths was 2.5 for Aboriginal people and 4.4 for non-Aboriginal people (Epidemiology Branch, THS). This male excess of injury deaths is also seen in national statistics (H&FS & AIHW 1998).

9.2 Injury death rates 1996



Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population, all causes of injury, by State and Territory of registration

Source: Bordeaux 1998 (reproduced with the permission of the National Injury Surveillance Unit)

Injury represents a higher proportion of deaths in the NT than elsewhere in Australia. This is not just because the NT has a smaller proportion of elderly people dying of chronic diseases such as heart failure or cancer. The age-adjusted rates of injury-related death are also higher (graph 9.2). This holds true even when allowance is made for statistical variations

arising from the relatively small population base of the NT.

While the population of the NT is small, it is spread over a large land area. There are almost twice as many injury deaths in Australia's most remote areas as elsewhere (H&FS & AIHW 1998). This partly explains the high injury rates among NT Aboriginal people, as one-third of NT Aboriginal people live in remote communities of less than 200 residents (ABS 1998). Moreover, their much higher injury death rates confirm a differential between Aboriginal and non-Aboriginal health that is evident in many other areas of health (Harrison and Moller 1994).

Death rate ratios for the three five-year periods 1981–85, 1986–90 and 1991–95 indicate that, compared with all of Australia, NT injury deaths were excessive for all groups and particularly for Aboriginal males and females (table 9.3). There was a steady drop in the injury death rate for Australian males, from 75 deaths per 100,000 in 1981–85 down to 60 deaths per 100,000 in 1991–95. Although both showed some reduction with time, the NT rates for Aboriginal and non-Aboriginal males remained considerably higher than the overall Australian rate in 1991–95. By that time, the injury death rate for NT non-Aboriginal men was 45% higher than the national figure; the rate for NT Aboriginal men was over three times that of Australian men; and the death rate for NT Aboriginal women was more than four times that of Australian women.

Of the 101 children aged one to 14 who died in the NT between 1991 and 1995, approximately half (53) died from injury related causes (d'Espaignet & others 1998). Non-Aboriginal children were three times more likely to die from injury (33.2 deaths per 100,000) than Australian children overall (9.8 deaths per 100,000). The death rate for Aboriginal children (47.5 per 100,000) was 43% higher than for non-Aboriginal children (d'Espaignet & others 1998).

9.3 Injury death rates and rate ratios 1981 to 1995

		Rate			Rate Ratio	
		NT Aboriginal	NT non-Aboriginal	Australia	NT Aboriginal: Australia	NT non-Aboriginal: Australia
Male	1981 to 1985	243.7	123.1	75.1	3.2	1.6
	1986 to 1990	263.0	114.3	71.4	3.7	1.6
	1991 to 1995	197.1	87.6	60.3	3.3	1.5
Female	1981 to 1985	118.9	33.3	29.4	4.0	1.1
	1986 to 1990	89.4	34.1	27.8	3.2	1.2
	1991 to 1995	101.3	30.0	23.0	4.4	1.3

Note: Rates are age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

A different type of mortality analysis: years of potential life lost

In Australia, most deaths result from diseases that are uncommon in young people and increasingly common with age, such as cardiovascular disease and cancer. Injury deaths have a disproportionate impact on the young. 'Years of potential life lost' is a measure of the impact of premature death. Illnesses, diseases and injuries that particularly affect young people cause more years of life to be lost than those which mainly affect the elderly. For example, a death at the age of 20 due to injury leads to more potential years of life lost than a death at the age of 60 due to heart disease. The following analysis is based on years of potential life lost before age 65.

9.4 Years of potential life lost in the NT 1995

Cause	Number of Deaths	YPLL
Mental	26	160
Genitourinary	16	220
Infectious	10	344
Endocrine	27	380
Congenital	12	631
Neoplasms	94	1,148
Respiratory	56	1,226
Circulatory	93	1,447
Injury	117	4,006

Notes: 'YPLL' means years of potential life lost before age 65
 'Genitourinary' includes chronic renal disease
 'Endocrine' includes diabetes
 'Neoplasms' include solid tumours (such as lung, breast and bowel cancers) and haematological malignancies (such as leukemia and lymphoma)

Data: Epidemiology Branch, THS

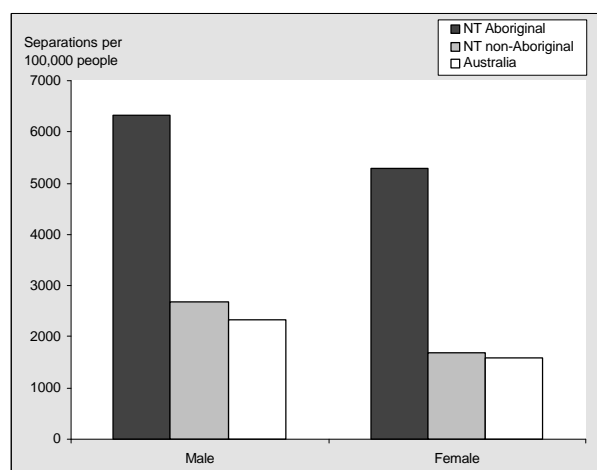
In the NT in 1995, more years of life were lost before the age of 65 years due to injury than because of any other single cause of death (table 9.4). Nearly three

times more years of potential life were lost through injury than through cardiovascular disease, which was the second commonest cause of death. Injury accounted for more years of life lost than all years of life lost from the combined total of respiratory disease, infectious disease, cancer, diabetes and renal disease. Australia-wide, most data are reported as YPLL before age 75, thus a direct comparison is not possible.

Illness caused by injury

Hospital admissions are used as a measure of harm caused by injury because this information is routinely collected and readily available. Many more injuries than are recorded by this method cause significant illness and short-term disability but do not result in hospitalisation or death. Therefore these statistics may underestimate the extent of disability caused by injury.

9.5 Injury admission rates



Note: Age-adjusted average annual hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population

Data: NT 1997—Epidemiology Branch, THS
Australia 1995–96—National Injury Surveillance Unit

Between 1993 and 1997, injury accounted for 21,693 of the NT's 207,627 hospital admissions. This figure for total admissions excludes normal births, interstate patients and same-day renal dialysis patients (see Appendix C for the breakdown of injury by cause and age of patient). In 1997, for both men and women, hospital admission rates for injury were higher than overall Australian rates: rates for Aboriginal Territorians were markedly higher than for either non-Aboriginal Territorians or Australians generally (graph 9.5).

In the NT, injury is the commonest reason for admission to hospital for children aged five to 14 years, regardless of Indigenous status (d'Espaignet & others 1998). Australia-wide, in 1997–98, injury

was the third most common reason for the hospitalisation of children, following respiratory illnesses and perinatal conditions. Accidental falls were the commonest cause of injury in Australian children hospitalised in that year (AIHW 2000).

The cost of illness caused by injury

The age standardised admission rate for injury in the NT greatly exceeds that for Australians overall, and the NT Aboriginal rate also exceeds the rate for Aboriginal Australians. For NT Aboriginal males, the injury admission rate is 6,337 per 100,000; for NT non-Aboriginal males it is 2,690 per 100,000, while for Australian males overall it is 2,329 per 100,000, and for all Australian Aboriginal males it is 4,740 per 100,000. The figures for females show a similar excess of injury admissions for Aboriginal women in the NT (5,283 per 100,000) compared to female Aborigines throughout Australia (4,096 per 100,000), while the figure for non-Aboriginal women (1,698 per 100,000) is similar to that for all Australian women (1,578 per 100,000).

9.6 Length of NT hospital stay for injuries 1997

Injury	Average Length of Stay (days)
Iatrogenic	10.69
Undetermined intent	8.86
Fire, burns, scalds	8.76
Transportation	7.72
Falls	6.11
Intentional—self-inflicted	4.22
Intentional—inflicted by another	4.01
Poisoning—other substances	3.89
Other unintentional	3.70
Poisoning—pharmaceuticals	2.87
Submersion	1.36
All causes	6.27

Notes: 'Other unintentional' includes injuries caused by natural disasters, excessive heat or cold, suffocation, animal bites, explosion, sports injuries, being caught or crushed, electricity, radiation, cutting and corrosive substances
'Iatrogenic' includes medical complications and medical misadventure
'Submersion' means near-drowning
'Poisoning—other substances' is accidental poisoning by non-medicinal solids, liquids, gases and vapours

Data: Epidemiology Branch, THS

In terms of bed days, a proxy for hospital costs, the 1997 burden of injury on health expenditure in the NT is represented by the total 27,312 hospital bed days attributable to injury. This constituted 12.2% of

bed days in the NT. The average length of hospital stay for injury was 6.3 days but there was considerable variation depending on the cause of injury (table 9.6).

Discharge from hospital is by no means the end of the physical, psychological or financial costs associated with an injury. Many injuries require prolonged periods of convalescence, sick leave, rehabilitation and ongoing health care; and many injuries result in enduring physical and psychological disability. Moreover, injuries that result in more significant psychological than physical damage, such as rape, often do not result in hospitalisation, and are not recorded in the official statistics.

Information about the causes, effects and prevention of injury in the NT would be enhanced by the availability of reliable data about injuries that do not result in hospitalisation or death. This would require information about injuries treated at remote health centres, in hospital emergency departments and by local doctors. Early experience with computerised client consultation information systems in remote health centres indicate that primary care workers already record detailed information about injuries, particularly those due to family violence. This experience is guiding the development of the Primary Care Information System (PCIS), a state-wide database for remote health centres.

Causes of injury

The four leading causes of injury death in the NT are: road transport accidents, homicide, suicide and drowning (table 9.7). The most common causes of injury death in children aged one to 14, in both the NT and Australia overall, are drowning and road traffic accidents (d'Espaignet & others 1998).

Road transport accidents

Road user deaths

In the period 1979 to 1995, road transport injuries were the leading cause of injury deaths in the NT (39%), and Australia-wide (36%) (table 9.7). In the NT, road transport injuries accounted for almost half the injury deaths for Aboriginal males (44%) and for non-Aboriginal females (47%) (Epidemiology Branch, THS). Between 1991 and 1995, road transport injuries caused one third of all injury deaths (32%) in children aged one to 14 (d'Espaignet & others 1998).

Analysis of data over the 17 years from 1979 to 1995 revealed that most people who died on NT roads were

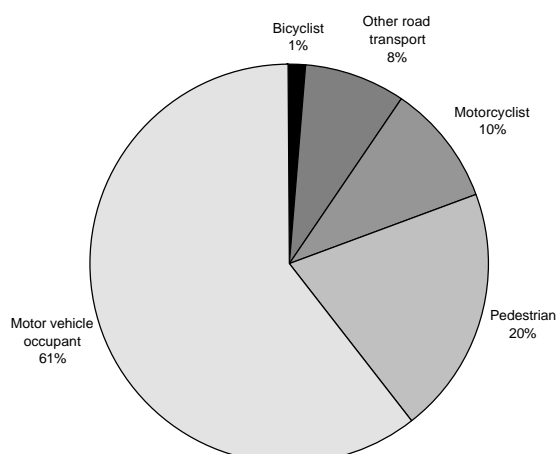
9.7 Causes of injury deaths 1979 to 1995

	Per cent		
	NT Aboriginal	NT non- Aboriginal	Australia
Male			
Road transport	44.1	36.9	35.7
Suicide	4.7	22.4	28.4
Other	18.3	19.2	17.4
Accidental falls	2.8	4.0	8.0
Drowning	8.9	9.2	5.4
Homicide	19.4	7.5	3.6
Fire, burns, scalds	1.7	0.8	1.6
Total	100.0	100.0	100.0
Number of deaths	639	1,030	93,422
Female			
Road transport	30.4	46.8	33.6
Accidental falls	4.0	5.5	22.6
Suicide	1.2	13.2	19.1
Other	22.9	17.4	14.4
Homicide	33.6	7.7	5.2
Drowning	4.7	9.4	3.0
Fire, burns, scalds	3.2	0.0	2.1
Total	100.0	100.0	100.0
Number of deaths	253	235	39,365

Note: 'Other' includes off-road transport, poisoning, misadventure during medical or surgical care, accidents caused by natural and environmental factors, suffocation and foreign bodies, and sports injuries

Data: Epidemiology Branch, THS

9.8 NT road user deaths: 1979 to 1995



Note: 'Other Road Transport' means pillion passengers and rear tray passengers

Data: Epidemiology Branch, THS

in motor vehicles, although pedestrians and motorcyclists accounted for significant proportions of NT road transport deaths (graph 9.8).

9.9 Road transport death rates and rate ratios 1981 to 1995

		Rate			Rate Ratio	
		NT Aboriginal	NT non-Aboriginal	Australian	NT Aboriginal: Australia	NT non-Aboriginal: Australia
Male	1981 to 1985	107.3	41.9	28.9	3.7	1.4
	1986 to 1990	117.9	36.8	24.6	4.8	1.5
	1991 to 1995	80.4	27.2	16.5	4.9	1.6
Female	1981 to 1985	26.7	12.8	10.6	2.5	1.2
	1986 to 1990	23.2	14.3	9.7	2.4	1.5
	1991 to 1995	31.2	8.1	6.9	4.5	1.2

Note: Rates are age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

From 1981 to 1995, NT road transport death rates were considerably higher, for both males and females, than Australian rates (table 9.9). The highest was for NT Aboriginal males, for whom the death rate in the period 1991–95 from road transport injury was nearly five times that of Australian males overall. Between 1981 and 1995 the age-adjusted death rates for road transport deaths of Australian males and females were roughly halved. There was a less substantial decline in the NT, with no decline evident for Aboriginal females. As a result, for both NT males and NT Aboriginal females, the rate ratio compared to the Australian population deteriorated over time.

Factors contributing to road transport injuries

The NT Road Safety Council has identified three main contributors to road injury deaths: alcohol, excessive speed and failure to use restraints.

The effect of alcohol

The NT Road Safety Council collates police data on the blood alcohol concentration (BAC) of people who die in road crashes in the NT. In 1972, the NT adopted 0.08% BAC as the legal limit. In December 1994, this was dropped to 0.05%. Between 1986 and 1996, 64% of drivers and motorcycle riders who died in the NT had a blood alcohol concentration of at least 0.05, compared with 36% for Australia as a whole (Road Safety Council of the NT 1998).

In 1997, of all NT road transport deaths for which the person's BAC was known (table 9.10), the proportion who had a BAC over the legal limit of 0.05% was:

- two in six motorcyclists
- nearly four in six drivers
- more than five in six pedestrians

Two-thirds of the NT pedestrians killed had a BAC reading of 0.2% or higher (Road Safety Council of the NT 1998).

9.10 Alcohol and road transport deaths 1997

Blood Alcohol Concentration (BAC)	Driver	Motorcyclist	Pedestrian	Total
Not known	3	1	2	6
Nil	8	4	2	14
0.001% to 0.049%	0	0	0	0
0.050% to 0.099%	3	0	0	3
0.100% to 0.199%	6	2	3	11
0.200% or over	5	0	10	15
Total	25	7	17	49
% of known with BAC \geq 0.05	63.6	33.3	86.7	67.4

Data: NT Road Safety Council

Police data indicate that alcohol was involved in 14% of NT road crashes in 1997, compared with about 20% at the start of the decade. There is, however, considerable variation between regions: alcohol was involved in 10% of crashes in Darwin, 23% in Alice Springs, and 18% in other regions (Road Safety Council of the NT 1998). By comparison, a study of deaths involving motor vehicle crashes among Aboriginal people in Western Australia found that 83% were alcohol-related (Williams and Maisey 1991).

In 1992, in recognition of the increased likelihood of alcohol-related problems in the NT, the Living With Alcohol (LWA) program was instituted. It is specifically designed to reduce the harms associated with alcohol use. A recent evaluation shows that in the four-year period following the introduction of the LWA program, there were 35% fewer road crashes resulting in non-fatal injuries requiring hospitalisation, a mean reduction of 14% in road crash injuries not requiring hospitalisation, and a mean reduction of 39% in alcohol-related road crash deaths (National Drug Research Institute & others 1999). For further information see the Substance misuse chapter.

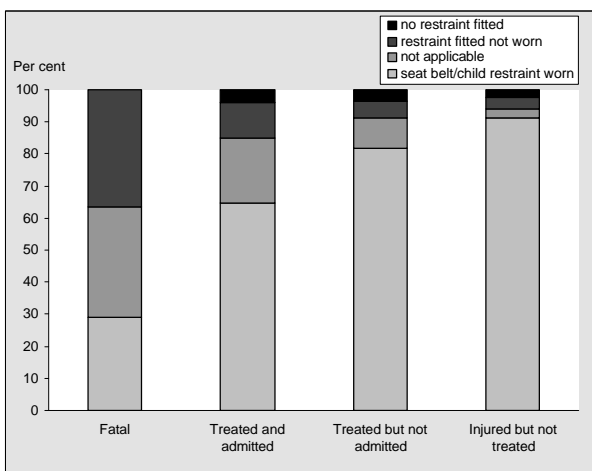
The effect of excessive speed

Many NT Aboriginal people live in remote areas where road surfaces are poor, people travel long distances and there are no speed restrictions outside of urban settlements—all factors that contribute to severe road crashes. Factors known to affect whether or not an injured car occupant dies before receiving medical assistance are the severity of their injury, their age, their blood alcohol content, the posted speed limit and whether or not the car was damaged beyond repair. Wood & others reported that the probability of dying before receiving medical assistance is greater when the posted speed limit is 80 km/h or over. In the event of a road crash in remote areas, people may die of their injuries before medical assistance arrives or transport to hospital can be arranged.

The effect of safety restraints

In more than 60% of all fatal road transport injuries in the NT in 1997, a seat belt or child restraint was not worn. This figure includes pedestrian deaths (graph 9.11). Approximately 20% of people hospitalised after a road transport accident had not been wearing safety restraints. Of those treated at hospital but not admitted, and those injured but not requiring medical attention, a smaller proportion were not wearing a restraint when involved in a road transport accident (Road Safety Council of the NT 1998).

9.11 NT death and severity of injury: using safety restraints 1997



Note: 'Not applicable' means pedestrians

Source: Adapted from Road Safety Council of the Northern Territory 1997

The impact of child restraints on NT road injury rates has not yet been determined. In the decade 1985 to 1994, none of the 28 children who died in car crashes on NT roads was wearing a safety restraint. Child restraints have been legally required in the NT since

1991, although the law does not require the use of a device appropriate to the age of the child (Silva & others 1998).

Children killed on the roads

Over the decade 1985 to 1994, 244 NT children aged between one and 14 died of all causes. Of these deaths, 53% resulted from injury, with 38% due to road transport injury. The death rate due to road transport injury is markedly higher in NT children than in Australian children overall. For Aboriginal children, the road transport death rate in the period 1991 to 1995 of 15.2 per 100,000, was four times the national rate, while for non-Aboriginal children it was three times the national rate at 10.7 per 100,000 (d'Espaignet & others 1998).

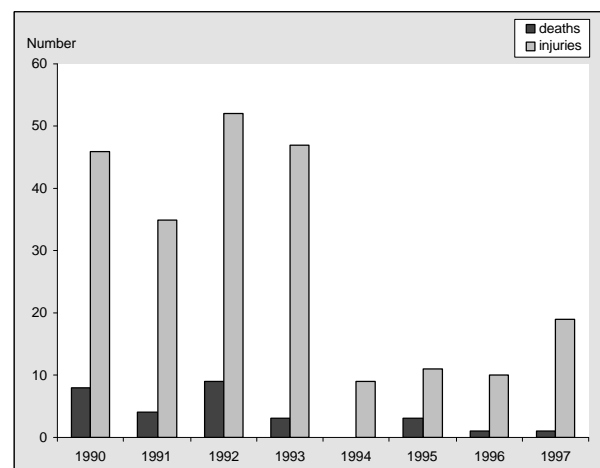
Children's road deaths may be divided into: motor vehicle collisions (21%); rollover or loss of control of the vehicle (30%—three-quarters of which were on rural roads); and pedestrian deaths (34%) (Silva & others 1998). Half of the pedestrian deaths were children under five years who were reversed over at home, often by four-wheel drive vehicles from which visibility of low objects may be poor. Of the drivers involved in the deaths of children aged one to 14:

- 46% were driving carelessly or speeding (Silva & others 1998)
- 29% had a blood alcohol concentration over the legal limit of 0.05%

These data reinforce the importance of limiting hazardous alcohol consumption, educating drivers and enforcing speed regulations.

Passenger travel in open vehicles

9.12 Death and injury from open vehicles in the NT



Data: NT Road Safety Council

The rear open area of utilities and tray-top trucks are neither designed nor safe for passenger travel. In response to the high rate of death and serious injury to passengers in open vehicles (graph 9.12), the NT enacted legislation in 1994 to prohibit this form of travel unless the vehicle is fitted with an approved rollover device and the driver drinks no alcohol (has a blood alcohol concentration of 0.00%).

In the two years before the law took effect, NT Road Safety Council field officers and Motor Vehicle Registry staff worked with police and community councils in remote areas to promote the use of rollover devices. In the four years following the requirement for rollover bars on open vehicles, passenger deaths fell to 2.1% of all road transport deaths compared with 10.3% in the four years beforehand. In the period 1994 to 1998, all deaths and all but one of the serious injuries to passengers in open vehicles were in vehicles not fitted with prescribed rollover devices (Garrow 1999).

The NT Road Safety Council reports that the legislation also altered vehicle purchase and registration patterns. Between 1994 and 1998, registration of twin cab utilities more than doubled; light buses increased by about 50%; station wagons increased slightly; and utilities remained static.

The improvement in death and injury figures may be attributed to two factors: reduced numbers of passengers carried in open vehicles (exposure reduction); and increased protection for those exposed (risk reduction) (Waters 1999).

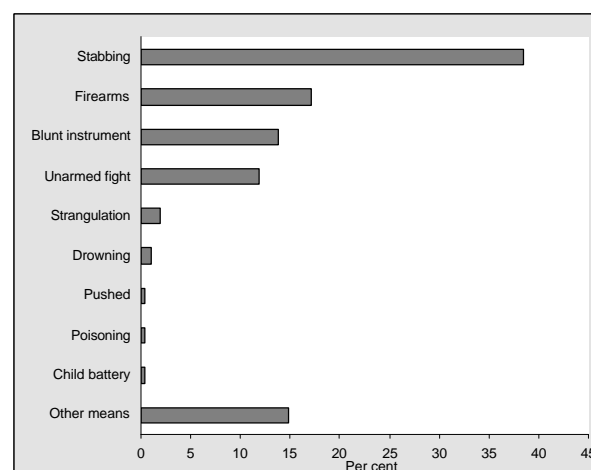
Homicide

Homicide accounts for a larger proportion of injury deaths in the NT than in Australia overall. Excessive alcohol consumption is known to be a major contributor to homicide (Cherpitel 1996, 1997). Death

rate ratios for the three five-year periods 1981–85, 1986–90 and 1991–95 reveal that, compared with Australia overall, homicide rates in the NT were excessive for all groups, but particularly for Aboriginal people (table 9.13).

While in 1991–95, the homicide rate for non-Aboriginal men was three times that of Australian men overall, the rate for Aboriginal men was 15 times that of Australian men. In the same time period, homicide was 14 times more common in Aboriginal women than in Australian women overall, and three times more common in non-Aboriginal women. However, while the Australian and NT non-Aboriginal homicide rates have remained fairly static, there has been a decline in homicide rates in Aboriginal men and women in the NT (table 9.13). Victims of homicide are most commonly women aged 25–44 and men aged 45–64 (Epidemiology Branch, THS).

9.14 NT methods of homicide 1979 to 1995



Note: 'Other means' include scalding, criminal neglect and unspecified means

Data: Epidemiology Branch, THS

Between 1979 and 1995, the commonest means of homicide in the NT were stabbing (39%) and firearms

9.13 Homicide rates and rate ratios 1981 to 1995

		Rate			Rate Ratio	
		NT Aboriginal	NT non-Aboriginal	Australia	NT Aboriginal: Australian	NT non-Aboriginal: Australian
Male	1981 to 1985	48.7	10.4	2.5	19.6	4.2
	1986 to 1990	61.9	4.6	2.6	23.9	1.8
	1991 to 1995	34.9	6.7	2.3	15.0	2.9
Female	1981 to 1985	41.3	3.3	1.4	28.5	2.3
	1986 to 1990	25.8	0.6	1.6	15.9	0.4
	1991 to 1995	20.1	4.4	1.4	13.9	3.0

Note: Rates are age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

(17%). Together, these methods accounted for more than half of NT homicides (graph 9.14). There were different patterns for Aboriginal and non-Aboriginal homicides: almost two-thirds of Aboriginal deaths involved stabbing or use of a blunt instrument, and 10% involved firearms. By contrast, about one-third of non-Aboriginal deaths involved stabbing or use of a blunt instrument, while another one-third involved firearms.

Drowning

Regardless of indigenous status or sex, Territorians are more likely to die from drowning than other Australians. Drowning is the leading cause of injury death in children aged one to 14, accounting for 37% of all injury deaths in children between 1991 and 1995 (d'Espaignet & others 1998). The vast majority of drownings occur in children under the age of five.

Drowning, usually in a home pool, is the main cause of death of non-Aboriginal children in the Northern Territory (Silva & others 1998). NT non-Aboriginal children have over eight times the rate of deaths due to drowning (16.6 per 100,000) as Australian children overall (2.0 per 100,000). The rate of drowning of Aboriginal children (11.4 per 100,000) also well exceeds the national rate (d'Espaignet & others 1998).

9.15 Sites of drowning of under five-year-olds: 1986 to 1995

	No.	%
Pool	18	60
Sporting activity	5	17
Boating activity	3	10
Accidental fall	2	7
Bathtub	2	7

Note: Children aged four years and under

Data: Epidemiology Branch, THS

In the decade to 1995, 30 children aged four and under drowned in the NT; 90% in the Top End (table 9.14). Most of these drownings occurred in home pools. Although there is an Australian standard for pool fencing and gates which dictates the height and structural requirements of the fence and gate, local government regulations dictate the extent of fencing. In the Territory, most pool owners are required to fence merely the perimeter of their property. In accordance with this legislation, the pool may be reached directly from the house or backyard, as long as the property itself is inaccessible from adjoining properties. However, children rarely wander into a

stranger's property and drown in their pool— most children drown in their own pool, or in that of a close friend. For this reason, isolation fencing, a fence that completely separates the pool or spa from the house and the rest of the property, is recommended by public health authorities (NT Kidsafe website 1999). Currently, in most of the NT, isolation fencing of pools, while recommended, is voluntary. NT-wide legislation requiring isolation fencing of all swimming pools would be a significant step towards preventing the majority of urban non-Aboriginal childhood deaths. Such legislation in Queensland (Pitt and Balanda 1998) and New Zealand (Fergusson and Horwood 1984) has already reduced deaths due to home pool drowning.

Of the 15 children drowned in home pools in the NT between 1985 and 1994, 14 were aged between one and four. Ten of the 15 deaths were in unfenced pools and none of the five 'fenced' pools met the Australian standards for the construction of swimming pool fencing (Silva & others 1998). In the same decade, 51% of all children aged one to 14 who drowned in the Territory did so in open waterways. These include the sea, rivers, lagoons, waterholes and rural dams. Thirteen of these 14 drownings were Aboriginal children (Silva & others 1998).

Hospital admission rates for submersion in children aged four and under are one of the national indicators of injury prevention and control (H&FS & AIHW 1998). In the three years to 1997, the NT hospital admission rate for submersion was 28 per 100,000 for children aged four years and under, compared with 22 per 100,000 Australia-wide and 32 per 100,000 for Aboriginal Australians (H&FS & AIHW 1998).

Suicide

While suicide is the second largest cause of injury deaths Australia-wide, it has, until recently, been a minor cause of injury deaths for Aboriginal people and for non-Aboriginal females in the NT. By contrast, nearly one quarter of NT non-Aboriginal male injury deaths in the period 1979 to 1995 resulted from suicide, and the male non-Aboriginal rate in this period was higher than the overall Australian rate (Dempsey & Condon 1999).

The number of suicides in the NT has increased considerably since 1995, for both Aboriginal and non-Aboriginal people. In 1997, the overall NT suicide rate was almost 50% higher than the Australian rate (ABS 1999). In some Aboriginal communities, suicide has become a major problem. For more information, see the Mental health chapter.

Accidental falls

Falls, which become more frequent with age, are less of a problem in the NT than Australia-wide because of its relatively young population (ABS 1997).

Preventing injury

In the past, injuries were perceived as inevitable—as ‘acts of God’ or ‘accidents’—or as the results of personal behaviour, but it is now recognised that many injuries are potentially preventable. For more than a decade, injury prevention has been recognised as a major method of improving the health of Australians (H&FS & AIHW 1998). The National Health Goals and Targets, National Better Health Program and, more recently, National Health Priority Areas have all emphasised the importance of injury prevention.

It is generally accepted that effective injury prevention requires a multidisciplinary and intersectoral approach. This is important because the health disciplines alone may not have access to all the information and strategies—such as engineering, regulation, legislation, enforcement, education and publicity—required to develop effective strategies to reduce death and illness from injury.

Increasing people’s awareness of the risks they face from injury complements legislative approaches to injury prevention. Whether a series of specific initiatives, such as preventing falls, preventing house fires, reducing scalds in the home, or preventing accidental medication poisoning, are cost effective in the NT, or whether the emphasis should remain on road safety and minimising harm from alcohol misuse, is a matter of current debate.

Examples of effective injury prevention measures include: lowering the permissible blood alcohol level for drivers, and enforcing this through random breath testing; and limiting the speed of road traffic, and enforcing this through speed or red light cameras. Compliance with restrictions, and hence the effectiveness of measures in reducing the road toll, is affected by the perception by citizens that they will be apprehended if they break the law, and that penalties will be severe.

Although primary prevention of injury is desirable, prevention of all injuries is not possible. Consequently, injury prevention efforts should be complemented by good quality trauma management and access to rehabilitation services.

Alcohol and injury

Alcohol misuse is a significant contributor to injury, and a major preventable cause of injury in the NT. It is estimated that alcohol contributes to 37% of road injuries among males and 18% among females. In addition, hazardous or harmful alcohol use is estimated to be the cause of 34% of fall injuries, 44% of fire injuries, 34% of drownings and 7% of occupational and machine injuries in Australia (English & others 1995). Excessive alcohol consumption is a major factor in assaults, homicides, brawls and violence against women (Cherpixel 1997, Fullerton & others 1998, Kyriacou & others 1998). Although exact figures are not available, one would expect these rates to be accentuated in the Territory because alcohol consumption is twice the national average: in 1996–97, the national per capita consumption of absolute alcohol was 7.61 litres, whereas the NT average was 15.55 litres (Alcohol and Other Drugs Program, THS).

Evidence suggests that restricting alcohol sales in communities can reduce the number of:

- visits to local hospital emergency departments with alcohol-related injuries (d’Abbs & others 1996, Douglas 1998)
- emergency evacuations resulting from injury (Douglas 1998)

A number of restrictions have been enacted by the Liquor Commission in the NT over the last decade. Together with other injury prevention programs, these restrictions may, with time, reduce the injury rate in the NT.

References

- ABS 1998, *Northern Territory in Focus 1996*, cat no 1306.7, ABS, Canberra.
- ABS 1999 *Cause of Death Australia* (series), cat no 3303.0, Canberra.
- AIHW 2000 *Australia’s Health 2000*, Canberra.
- d’Abbs P 1998, ‘Out of sight, out of mind? Licensed clubs in remote Aboriginal communities’, *Australian and New Zealand Journal of Public Health*, vol 22, no 6, pp679–84.
- d’Abbs P, Togni S & Crundall I 1996, *The Tennant Creek Liquor Licensing Trial, August 1995 to February 1996: An evaluation*, Menzies School of Health Research and NT Living with Alcohol Program, Darwin.
- D’Espaignet ET, Kennedy K, Paterson BA & Measey ML 1998, *From Infancy to Young Adulthood: Health Status in the Northern Territory*, THS, Darwin.

- Cherpitel CJ 1996, 'Drinking patterns and problems and drinking in the event: an analysis of injury by cause among casualty patients', *Alcoholism, Clinical and Experimental Research*, vol 20, no 6, pp1130–7.
- Cherpitel CJ 1997, 'Alcohol and violence-related injuries in the Emergency Room', *Recent Developments in Alcoholism*, vol 13, pp105–18.
- Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory 1979 to 1997*, THS Darwin.
- Douglas M 1998, 'Restriction of the hours of sale of alcohol in a small community: a beneficial impact', *Australian and New Zealand Journal of Public Health*, vol 22, no 6, pp714–9.
- English DR, Holman CDJ, Milne E and others 1995, *The Quantification of Drug Caused Morbidity and Mortality in Australia*, Commonwealth Department of Human Services and Health, Canberra.
- Fullerton L, Olson L, Crandall C and others 1998, 'Relationships between ambulance transports for alcohol intoxication and assault', *Academic Emergency Medicine*, vol 5, no 4, pp325–9.
- Fergusson D & Horwood B 1984, 'Risks of drowning in fenced and unfenced domestic swimming pools', *New Zealand Medical Journal*, vol 97, pp777–9.
- Garrow SC 1999, 'Kimberley utility truck passenger fatalities' (letter), *Australian and New Zealand Journal of Public Health*, vol 23, p108.
- H&FS & AIHW 1998, *National Health Priority Areas Report: Injury Prevention and Control 1997*, AIHW cat no PHE 3, Canberra.
- Harrison J & Moller J 1994, 'Injury mortality amongst Aboriginal Australians', *Australian Injury Prevention Bulletin*, no 7.
- Kyriacou DN, McCabe F, Anglin D and others 1998, 'Emergency department-based study of risk factors for acute injury from domestic violence against women', *Annals of Emergency Medicine*, vol 31, no 4, pp502–6.
- National Drug Research Institute and Lewin-Fordham Group 1999, *The Public Health, Safety and Economic Benefits of the Northern Territory's Living with Alcohol Program 1992/3 to 1995/6*, Curtin University of Technology, Perth.
- NT Kidsafe web site:
<http://www.ozemail.com.au/~kidsafen/S2about.htm>
- Pitt WR & Balanda KP 1998, 'Toddler drownings in domestic swimming pools in Queensland since uniform fencing requirements' (letter), *Medical Journal of Australia*, vol 169, no 10, pp557–8.
- Road Safety Council of the Northern Territory 1996, *Northern Territory Road Accident Statistics 1995*, Road Safety Council of the Northern Territory and Department of Transport and Works, Darwin.
- Road Safety Council of the Northern Territory 1998, *Northern Territory Road Accident Statistics 1997*, Road Safety Council of the Northern Territory and Department of Transport and Works, Darwin.
- Silva DT, Ruben AR, Wronski I and others 1998, 'Excessive rates of childhood mortality in the Northern Territory, 1985–94', *Journal of Paediatrics and Child Health*, vol 34, no 1.
- Waters A 1999, 'Road safety project', *Kimberley Public Health Bulletin*, vol 19, pp14–15.
- William S & Maisey G 1991, *Aboriginal Road Crash Fatalities, Western Australia, 1980–89*, WA Police Department Research and Statistics Section, Perth.
- Wood JT, O'Neill TJ & Donnelly CF 1994, *Analysis of Medical Data from Fatal Road Crashes*, Federal Office of Road Safety, Canberra.

Chronic diseases

by Tarun Weeramanthri and Louise Clark

This chapter focuses on the five chronic diseases that together accounted for more than one-fifth of all NT deaths between 1979 and 1995 (Dempsey & Condon 1999):

- kidney (renal) disease
- diabetes
- high blood pressure (hypertension)
- heart attack and related heart disease (ischaemic heart disease)
- chronic obstructive airways disease (including emphysema and chronic bronchitis)

These chronic diseases cause pain, disability and early death for many Territorians. Society as a whole bears the direct cost of ongoing health care, but the indirect costs are also considerable, since the quality of many individuals' social and family life is affected, and their work productivity may suffer.

To alleviate the human and economic costs of chronic diseases, Territory Health Services (THS) is coordinating the development of an integrated Preventable Chronic Diseases Strategy. The aim is to introduce prevention practices, screening and community-based support so that people avoid these diseases or reduce the severity and impact of the disease processes. It is a staged, long-term strategy to overcome problems that themselves have arisen over many years. The strategy includes a number of 'best buy' interventions within each of six key result areas:

1. Maternal health
 - improving infant birth weight
2. Promotion of child growth
 - breastfeeding
 - preventing childhood malnutrition
 - decreasing childhood infections through better environmental health conditions
 - childhood immunisation
3. Underlying determinants of health
 - maternal and childhood education
 - alleviate poverty
 - promote 'sense of control' and mental well-being

4. Lifestyle modification
 - smoking cessation and prevention programs
 - brief intervention for hazardous alcohol use
 - nutrition, weight loss and physical activity programs in high risk populations
5. Early detection and early treatment
 - screening for specific chronic diseases
 - adult immunisation
 - aggressive blood pressure lowering to prevent progression of kidney disease
6. Best practice management
 - prevention of complications of diabetes
 - aggressive management of heart attacks and known cardiovascular disease
 - rehabilitation and outreach programs for heart, respiratory and kidney disease

Information on the magnitude of the problems caused by chronic diseases, including the burden of living with a disability, and the impact of premature death, is increasingly important in setting health sector priorities. The main sources of information about chronic diseases in the NT are death and hospitalisation statistics. Secondary data sources include chronic disease registers in some primary health care services. In 1999 THS commenced developing an integrated public health information strategy to improve information about the occurrence (prevalence and incidence) of chronic diseases, the risk factors that lead to chronic diseases, and the success of efforts to prevent and treat them.

Who gets chronic diseases?

As in the rest of Australia, chronic diseases are becoming more prominent health problems as the NT population ages. Although chronic diseases are both a Territory-wide and Australia-wide problem, Aboriginal people are particularly affected.

For non-Aboriginal Territorians, as for other Australians, improvements in social, environmental and economic conditions over the past century have improved nutritional status, and reduced the impact of infectious diseases and the dangers in our

environment (although some new ones have been introduced). As life expectancy has increased, the major health problems most people face during their lives have changed from infectious diseases to the chronic diseases of older age.

However, poor nutrition, environmental dangers and infectious diseases remain serious threats to the health of NT Aboriginal people. In addition, rapid change to traditional Aboriginal life has led to the onset of chronic diseases in early and middle adult life, to a much greater extent than in other Australians. The Aboriginal population bears a double burden with chronic diseases rising rapidly at the same time as they remain beset with health problems that other Australians left behind generations ago.

The causes of chronic diseases

In part, chronic diseases originate in genetic predispositions inherited from our parents and the experiences of pregnancy and early childhood. The experiences of later life resulting from such factors as poor nutrition, lack of exercise, inadequate environmental health infrastructure, smoking and alcohol misuse add to and amplify these initial influences (see the Substance misuse chapter). In recent years the attention of researchers has returned to the possible life-long consequences of damage during pregnancy and early childhood.

The 'Barker hypothesis' (named after British researcher David Barker) proposes that environmental factors 'programme' particular body systems during critical periods of growth, in utero and in infancy, with long-term direct consequences for adult chronic disease. It specifically links maternal malnutrition during pregnancy and impairment of fetal and infant growth with the subsequent development in adulthood of hypertension, diabetes and high blood cholesterol levels and death from ischaemic heart disease and chronic obstructive airways disease (Barker 1993). Research in Top End Aboriginal communities has provided further evidence linking low birth weight with the subsequent development of kidney disease (Hoy & others 1998a).

The rapid improvement in Aboriginal infant mortality since the 1960s has not been accompanied by a similar reduction in childhood malnutrition and infectious

diseases. In the mid-1990s, the average birthweight of Aboriginal babies in the NT remained approximately 200g less than non-Aboriginal babies (Markey & others 1998), and impaired growth during childhood was common (see the Children's health and welfare chapter). The long-term effects of these stormy early years are not certain, but will very likely contribute to the epidemic of chronic diseases among NT Aboriginal people in adult life. Thomas (1998) has noted the irony of improvements in health care and child survival rates in Aboriginal communities over the past 30 years contributing to a generation of adults at high risk of chronic disease.

These chronic diseases and their risk factors are also inextricably linked to the broader socioeconomic determinants of health, particularly education and employment (see the Underlying causes chapter). Although the exact causes of chronic diseases are not fully understood, it is clear that most are due to more than one single factor. Social disadvantage is linked to infectious diseases, malnutrition, poor living conditions and poor hygiene, and chronic diseases have the most impact on the socially disadvantaged (Mathews & others 1995).

The chronic diseases discussed in this chapter are interrelated, and many have shared risk factors. People who suffer from one chronic disease often develop others, and this amplifies the burden of ill health they face. This is particularly true for NT Aboriginal people, many of whom suffer from more than one chronic disease.

The impact of chronic diseases

In the NT, between 1979 and 1997, circulatory disease (including ischaemic heart disease) was the leading cause of death for Aboriginal males and females and non-Aboriginal females, and second to injury for non-Aboriginal males. Respiratory disease (including chronic obstructive airways disease) was the third leading cause of death for Aboriginal males, the second leading cause of death for Aboriginal females and the fourth leading cause of death for non-Aboriginal males and females (Dempsey & Condon 1999).

Of the 11,155 deaths in the NT between 1979 and 1995, 2,513 or 23% were due to five major chronic

10.1 NT deaths from chronic diseases 1979 to 1995

Chronic disease	Deaths	
	No.	%
Heart attack and related heart disease (ischaemic heart disease)	1,305	11.7
Respiratory disease (chronic obstructive airways disease)	690	6.2
Diabetes	275	2.5
Kidney (renal) failure	122	1.1
High blood pressure (hypertension)	121	1.1
Total	2,513	22.5

Note: Number of deaths for selected diseases and proportion of total deaths

Source: Dempsey & Condon 1999

diseases (table 10.1). By comparison, other major causes of NT deaths during this period were: motor vehicle accidents, which accounted for 6% of all deaths; homicide and suicide (5%); pneumonia and influenza (5%); cerebrovascular disease (4%) and lung cancer (4%) (Dempsey & Condon 1999).

10.2 NT ischaemic heart disease death rates 1991 to 1995

	NT Aboriginal	NT non-Aboriginal	Australia
Male			
0-4	0.0	0.0	0.0
5-24	0.0	0.0	0.3
25-44	120.5	10.9	12.0
45-64	629.4	131.8	171.6
65+	1,236.7	969.5	1,481.6
Female			
0-4	0.0	0.0	0.1
5-24	0.0	0.0	0.0
25-44	27.8	0.0	2.5
45-64	244.2	19.7	49.1
65+	1,080.9	434.9	1,101.9

Note: Age-specific average annual death rates per 100,000 people

Source: Dempsey & Condon 1999

Chronic diseases impact on NT Aboriginal people at a younger age than NT non-Aboriginal people or Australians generally. This can be seen in the ischaemic heart disease death rates in each age group. Between 1991 and 1995, ischaemic heart disease

death rates for young Aboriginal adults in the NT were similar to those of non-Aboriginal people ten to twenty years older (table 10.2).

Kidney disease

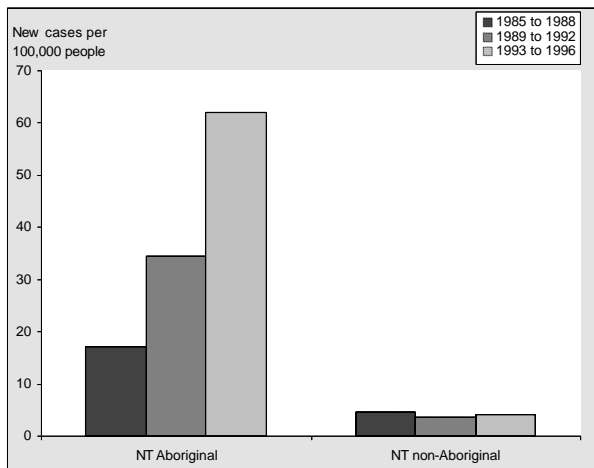
Chronic renal failure (kidney failure) is the result of irreversible kidney damage. To stay alive, people with kidney failure require either a kidney transplant or renal (kidney) dialysis every few days. The dramatic rise in the incidence of kidney failure in NT Aboriginal people has been highlighted by the work of Dr Wendy Hoy and her team at the Menzies School of Health Research in Darwin (Spencer & others 1998).

The human cost of this epidemic of kidney failure is high. Most Aboriginal people with kidney failure have moved to Darwin or Alice Springs to access renal dialysis. A remote self-care dialysis unit has operated at Nguuu on the Tiwi Islands since early 1999, and another opened in Katherine in June 2000. Dislocation from land and family adds to the stress and practical difficulties of dealing with strict treatment regimes for a disease that is a 'new' kind of illness and not fully understood (Devitt & McMasters 1998).

The survival of patients with kidney failure is significantly worse for Aboriginal people. Their median survival time is 3.6 years from the onset of kidney failure, compared with 12.3 years for non-Aboriginal people (Spencer & others 1998). This difference is partly due to a greater number of co-existent illnesses, a higher rate of serious infection, and a higher rate of withdrawal from treatment.

The health service costs of this rapidly rising epidemic of kidney disease are a major demand on resources. In the years up to 1998, the number of dialysis procedures rose by 28% per year in the Top End (Spencer & others 1998). This is an unsustainable burden since the cost of dialysis treatment was estimated by Royal Darwin Hospital in 1997 to be over \$56,000 per person per year (RDH, unpublished). This estimates the direct cost of dialysis treatment, and does not include the cost of associated health care such as hospital admissions for complications or other illnesses, nor indirect costs such as relocation to and accommodation in Darwin or Alice Springs.

10.3 Top End incidence of kidney failure 1985 to 1996

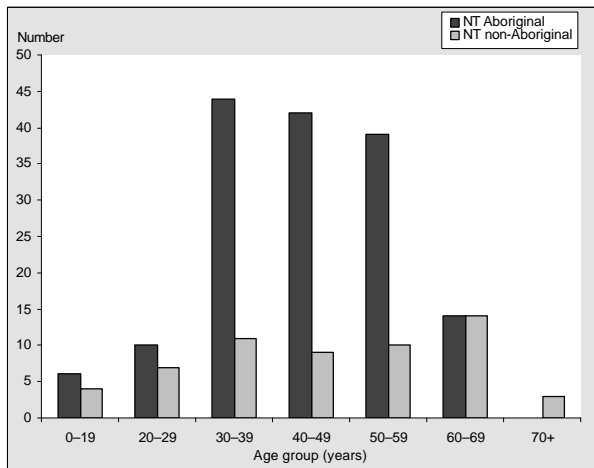


Note: Age-adjusted average annual end-stage renal incidence rates per 100,000 people, standardised to Australian 1991 population

Source: Spencer & others 1998

Over the 12 years to 1996, the incidence of kidney failure in Aboriginal people in the Top End doubled every four years while the rate in non-Aboriginal people remained constant (graph 10.3).

10.4 NT commencement of dialysis treatment 1978 to 1996



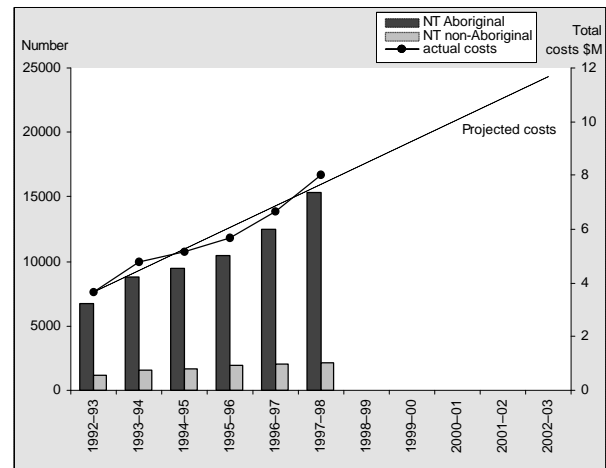
Note: Number of people commencing renal dialysis treatment for end-stage renal disease

Data: Spencer unpublished

In the years 1978 to 1996, the majority of people commencing treatment for kidney failure in the NT were Aboriginal people aged between 30 and 60 years (table 10.4)

The number of renal dialysis treatments in the NT more than doubled between 1992-93 and 1997-98, at which time these procedures cost in the vicinity of \$8 million (graph 10.5).

10.5 NT renal dialysis hospital admissions and costs



Note: Projected renal dialysis costs are based on actual NT public hospital costs for the years 1992-93 to 1997-88

Source: THS 1998

Good preventive practice in the use of long-acting angiotensin converting enzyme inhibitors (ACEI) delays the onset of kidney disease for those with high blood pressure, diabetes and significant albuminuria (protein in the urine, a sign of kidney damage). This has been supported by research carried out by the Menzies School of Health Research (Hoy 1998b). These practices are now incorporated into best practice management guidelines across the NT.

Diabetes

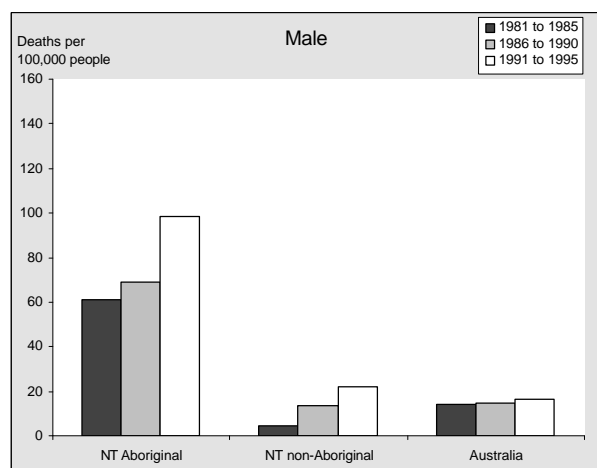
Diabetes impairs the body's ability to use sugar. There are two main types:

- Type 1, which usually starts suddenly during childhood and requires daily insulin injections to maintain control of glucose (sugar) levels in the body
- Type 2, which usually starts in overweight people in adulthood

People with type 2 diabetes can usually control their blood sugar levels with a combination of weight loss, exercise, changed eating habits and by taking tablets. They usually do not require daily insulin injections. Adult-onset (type 2) diabetes is a serious chronic disease that affects many Aboriginal Territorians. 90% of diabetics have type 2 diabetes (McCarty & others 1996).

There were dramatic rises in diabetes-related death rates in NT Aboriginal people, particularly females, between 1981 and 1995; while the rates in NT non-Aboriginal people showed no clear pattern (graphs 10.6 and 10.7).

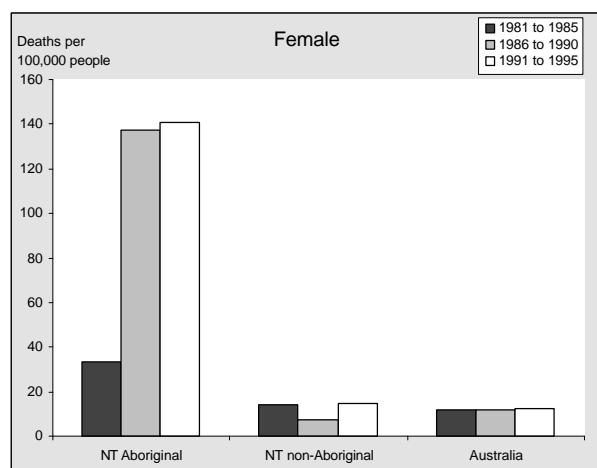
10.6 NT male diabetes death rates 1981 to 1995



Note: Age-adjusted average annual death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

10.7 NT female diabetes death rates 1981 to 1995



Note: Age-adjusted average annual death rates per 100,000 people, standardised to Australian 1991 population

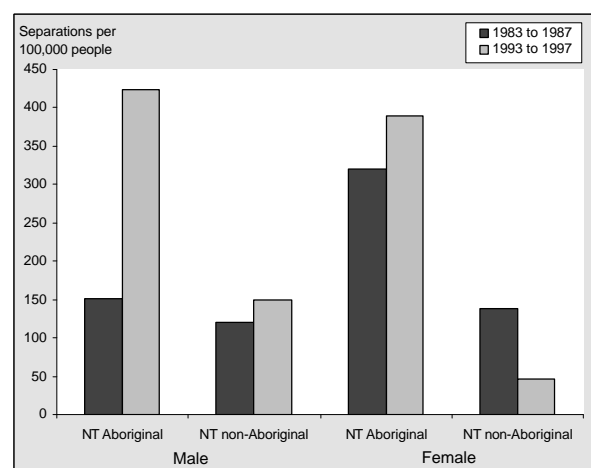
Source: Dempsey & Condon 1999

Similarly, NT hospital admission rates for diabetes increased between 1983 and 1997 for NT Aboriginal people (graph 10.8), while showing no clear pattern in non-Aboriginal people.

The impact of diabetes on other chronic diseases

Diabetes commonly occurs together with other chronic diseases, and is one of the causes of ischaemic heart disease (heart attack and related heart disease) and kidney disease. Diabetes was associated with 14% of cases of kidney failure in the Top End between 1989 and 1992, and 26% of cases between 1993 and 1996 (Spencer & others 1998).

10.8 NT diabetes hospital admissions 1983 to 1997



Note: Age-adjusted average annual hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

Diabetes is a common reason for inpatient hospital treatment, particularly in Aboriginal people (graph 10.8). Diabetes is also frequently present in patients who are hospitalised with other chronic diseases (see table 10.9).

10.9 NT hospital admissions: diabetes with other chronic diseases 1993 to 1997

Principal Reason for Admission	Total No.	Diabetes also present	
		No.	%
Kidney (renal) failure	761	348	45.7
High blood pressure (hypertension)	280	75	26.8
Heart attack and related heart disease (ischaemic heart disease)	2,469	576	23.3
Respiratory disease (chronic obstructive airways disease)	1,389	153	11.0
All causes (excluding diabetes)	151,805	7,954	5.2
Motor vehicle accidents	3,464	80	2.3

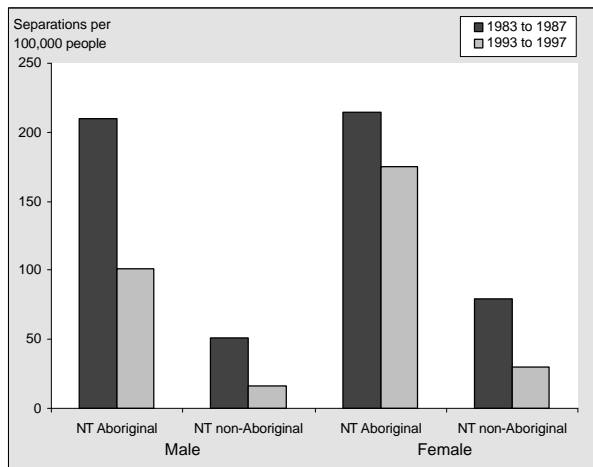
Notes: NT public hospital admissions for selected chronic diseases where the patient also had diabetes

Data: Epidemiology Branch, THS

From 1993 to 1997, 46% of people admitted for kidney failure, 27% admitted for high blood pressure and 23% of people admitted for ischaemic heart disease also had diabetes. By contrast, only 2.3% of people admitted because of motor vehicle injury also had diabetes recorded as an additional diagnosis (table 10.9).

Hypertension

10.10 NT hypertension hospital admissions



Note: Age-adjusted average annual hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population for 1983–1987 and 1993–1997

Data: Epidemiology Branch, THS

There is very little information available about the incidence and prevalence of hypertension in the community. But we do know that hospitalisation rates for hypertension as the principal diagnosis declined dramatically from 1983 to 1997 for all NT population groups (table 10.10). The explanation for this probably lies in improved methods of blood pressure control available in the community, leading to a dramatic fall in the number of people with uncontrolled hypertension.

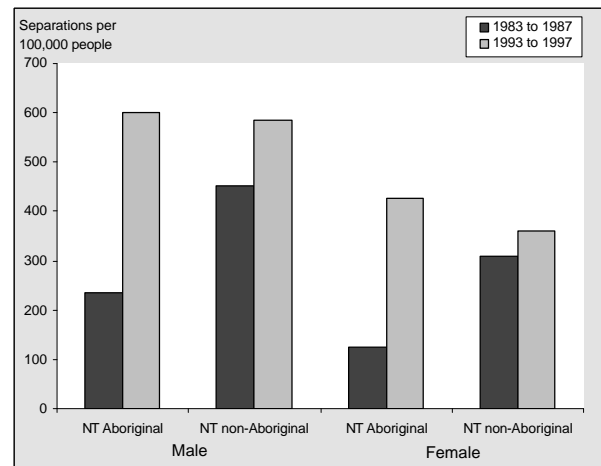
Ischaemic heart disease

Damage to and blockage of the arteries that supply blood to the heart itself (the coronary arteries) is called ischaemic heart disease. This damage can lead to insufficient blood supply to the heart, producing temporary pain during exercise (angina), permanent death of part of the heart muscle (a heart attack, or myocardial infarction) and/or heart failure. Both diabetes and hypertension can slowly damage the coronary arteries, which if severe enough leads to ischaemic heart disease.

There has been a striking fall in deaths from ischaemic heart disease in Australia since the late 1960s. The period 1988 to 1995 also saw an overall reduction in NT deaths, but Aboriginal men still had approximately twice the rate of death from ischaemic heart disease compared with non-Aboriginal men, and Aboriginal women approximately three times the rate of death compared with non-Aboriginal women (Ong 1998).

Compared with men, women are relatively protected from ischaemic heart disease throughout life (Tunstall-Pedoe 1998), but from 1988 to 1995, NT Aboriginal women had higher rates of ischaemic heart disease than non-Aboriginal men in all age groups except those women aged over 65 (Ong 1998).

10.11 NT ischaemic heart disease hospital admissions



Note: Age-adjusted average annual hospital separation (admission) rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

NT hospitalisation rates for ischaemic heart disease rose dramatically in the period 1987 to 1996 for both Aboriginal men and women (graph 10.11). This was especially noticeable in those aged between 35 and 55 years: by 1996, hospital admission rates for NT Aboriginal people in this age group far exceeded those for NT non-Aboriginal people. In recent years, the excess proportion of hospitalisations for ischaemic heart disease in Aboriginal people has started to approach the excess proportion of deaths in Aboriginal people—this is one indicator of appropriate access to services based on need (Ong 1998).

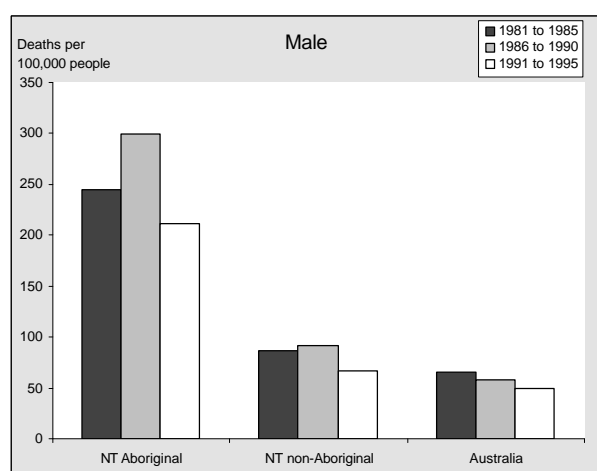
Chronic obstructive airways disease

Chronic obstructive airways disease is a term that refers to permanent and progressive damage that occurs in the lungs of many older adults. It includes chronic bronchitis and emphysema. This damage involves destruction of the finer parts of the lungs where oxygen and carbon dioxide are exchanged between inhaled air and the blood. As this damage becomes more severe, the lungs become progressively less able to take in oxygen and expel carbon dioxide, and a person with chronic obstructive airways disease becomes more and more short of

breath and less able to work and perform other activities. They may also become increasingly prone to lung infections, which can worsen the original lung damage.

Smoking is the most common cause of chronic obstructive airways disease in Australia, but inhalation of other irritant chemicals can also cause severe lung damage. Serious or repeated lung infections in childhood, which are common in Aboriginal children, are also believed to initiate progressive lung damage which can present in adulthood as chronic obstructive airways disease.

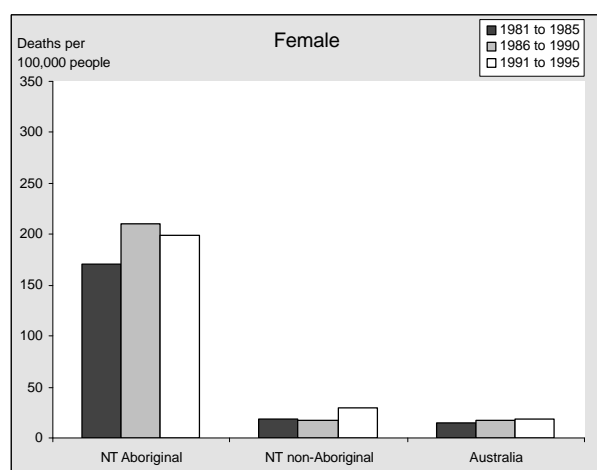
10.12 Male chronic obstructive airways disease death rates



Note: Age-adjusted average annual death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

10.13 Female chronic obstructive airways disease death rates



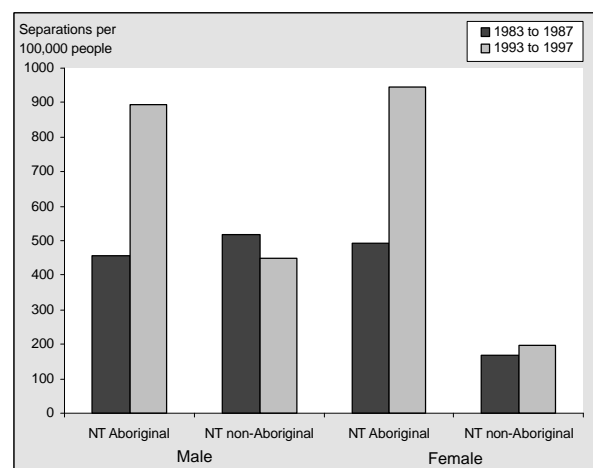
Note: Age-adjusted average annual death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

Between 1981 and 1995, NT chronic obstructive airways disease death rates fluctuated but showed

no definite trend. Death rates in Aboriginal Territorians were many times higher than in Australians generally, particularly in females (graphs 10.12 and 10.13).

10.14 NT chronic obstructive airways disease hospital admissions



Note: Age-adjusted average annual hospital separation rates per 100,000 people, standardised to Australian 1991 population

Data: Epidemiology Branch, THS

In the NT, hospitalisation rates for chronic obstructive airways disease showed a dramatic rise in both Aboriginal men and women from 1983 to 1997, while remaining relatively constant in non-Aboriginal people (graph 10.14). Initiatives to prevent the uptake of tobacco smoking and help smokers of all ages to quit are vital to arresting the growing impact of chronic obstructive airways disease (see the Substance misuse chapter).

References

- Barker DJP 1993, *Mothers and babies and disease in later life*, BMJ Publishing Group, London.
- Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory, 1979–1995*, Epidemiology Branch, THS, Darwin.
- Devitt J & McMasters A 1998, *Living on medicine: a cultural study of end-stage renal disease among Aboriginal people*, IAD Press and Central Australian Aboriginal Congress, Alice Springs.
- Hoy WE & others 1998a, 'Low birthweight and renal disease in Australian Aborigines.' *Lancet*, vol 352, pp1826–7.
- Hoy WE 1998b, 'Screening and treatment for renal disease: the community model', *Nephrology*, suppl iii–iv, pp590–5.

- Hoy WE and others 1999, 'Stemming the Tide: Reducing Cardiovascular Disease and Renal Failure in Australian Aborigines', *Australian and New Zealand Journal of Medicine*, vol 29, pp480-3.
- McCarty and others 1996, *The rise and rise of diabetes in Australia, 1996, A review of statistics, trends and costs*, International Diabetes Institute, Melbourne.
- Markey PG, Weeramanthri TS & Guthridge S 1996, *Diabetes in the Northern Territory*, Diabetes Australia (NT), Darwin.
- Markey PG, d'Espaignet ET, Condon JR & Woods M 1998, *Trends in the Health of Mothers and Babies, Northern Territory 1986-95*, Territory Health Services Darwin.
- Mathews J and others 1995, 'At First the Infant', *Today's Life Science*, vol 7, no 8.
- Ong M 1998, The epidemiology of ischaemic heart disease in the Northern Territory, Bachelor of Medical Science thesis, Menzies School of Health Research, Darwin (unpublished).
- Spencer JL, Silva DT, Snelling P & Hoy WE 1998, 'An epidemic of renal failure among Australian Aborigines', *Medical Journal of Australia*, vol 168, pp537-41.
- Thomas M 1998, 'Kidney disease in Aboriginal Australians: time for decisive action' (editorial), *Medical Journal of Australia*, vol 168, pp532-3.
- THS 1998, *Annual Report, 1997-98*, Territory Health Services, Darwin.
- Tunstall-Pedoe H 1998, 'Myth and paradox of coronary risk and the menopause', *Lancet*, vol 351, pp1425-7.

Cancer

by Sid Selva-Nayagam, Michael Pearce and Cynthia Croft

What is cancer?

Cancer is a term used to describe a collection of abnormal cells which proliferate and spread because of the loss of the normal mechanism that regulates cell growth. Cancer cells usually all derive from a single mother cell and are therefore identical (monoclonal). There are about 100 recognised types of cancer in humans, but cancer is not unique to humans.

A series of changes (mutations) in cell DNA over many years, usually in the genes responsible for cell regulation, leaves a cell and its descendants bereft of normal internal control mechanisms. This enables cancer cells to multiply and spread. The uncontrolled growth of cancer cells destroys normal cells, causing sickness and possibly death.

Examples of cell changes include (Weinberg 1996; Ruoslahti 1996):

- mutation of the genes involved in normal cell growth (proto-oncogenes) so that they lose their normal cell regulation processes and become oncogenes, which initiate excessive cell multiplication
- mutation and subsequent inactivity of tumour suppressor genes, resulting in uncontrolled cell growth
- derangements of the cell cycle clock and loss of the ability to program cell death (apoptosis), which means cells survive longer than they should
- cells become 'immortal', thereby acquiring the ability to divide indefinitely
- cells acquire the ability to spread (metastasise) by decreasing their stickiness to each other and being able to survive while floating free

It is clear from epidemiological and other studies that environmental, genetic and physiological factors cause or are linked to cancer, and these factors commonly interact. Each cancer has its own set of causative and associated factors.

Environmental factors associated with cancer include smoking, diet, alcohol, viruses such as hepatitis B and

human papilloma virus, radiation and specific agents such as asbestos. Exactly how they influence cancer development is not certain; some cause mutations and others selectively enhance the growth of tumour cells or their precursors. Smoking and diet each contribute to 30% of cancer-related deaths and are the two most common environmental causes of cancer deaths in the developed world (Trichopoulos & others 1996). Smoking-related cancers are estimated to account for 13% of cancers and 21% of all cancer deaths in Australia (English & others 1995).

Genetic factors contribute to about 5% to 10% of cancers (Ruoslahti 1996). A mutation that predisposes to cancer development in any cell—and in particular germ cells, the cells from which sperm and ova originate—may be passed to offspring. Since cancer is the result of cumulative mutations, the presence of a mutation at birth reduces the number of spontaneous mutations that must occur after birth to initiate cancer. This explains why individuals with a family history of cancer tend to present with cancer earlier in life.

Physiological factors linked to cancer include age, gender, obesity and starting periods at a young age (early menarche). Most cancers are rare in early adulthood, becoming common only at much older ages.

A cancer is usually described according to its behaviour and the part of the body and cell type from which it originated—for example, lung adenocarcinoma is a malignant cancer of glandular cells in the lung. The following steps are necessary to assess a patient's prognosis (the chance of cure, or likely survival time) and to determine the best course of treatment:

- examining a specimen of cancer tissue (biopsy) with a microscope to determine whether it is slow-growing or aggressive
- assessing the size of the cancer and how far it has spread in the body (staging)

Managing a cancer patient often involves several cancer specialties and a range of other health professions, using a multidisciplinary team approach. Treatment may:

- be localised to the site of the cancer (surgery, radiotherapy) or systemic (chemotherapy, hormonal therapy, or immunotherapy), or combinations of two or more of these options
- attempt cure, and/or alleviate symptoms, and/or prolong life

Management also involves caring for the emotional, psychological, and social wellbeing of the patient.

The burden of cancer

Why is cancer important? The incidence of cancer is increasing by about 1% per year because of our ageing population and increased diagnosis (H&FS 1998). From 1979 to 1995, cancer was the second leading cause of death (after circulatory disease) in Australia and the third leading cause of death in the NT (after cardiovascular disease, and injury and poisoning) (Dempsey & Condon 1999). Approximately 32,000 Australians and 120 Territorians die each year of cancer.

The annual direct cost of cancer is estimated to be \$1.9 billion dollars, representing about 6% of total recurrent health expenditure. Indirect costs are of a similar magnitude (H&FS 1998). The cost of anxiety, pain and suffering to individuals with cancer and their families is considerable but difficult to measure.

Cancer control

Cancer control includes prevention, early detection and optimal management. Cancer control is a national health priority (H&FS & AIHW 1998). In an effort to enhance cancer control, a national cancer control initiative was established in 1997. This is a partnership between the Commonwealth and State governments, non-governmental agencies, professional bodies and consumer groups. It aims to prioritise, develop and implement strategies for improved cancer control.

There are two national cancer screening programs in Australia—for female breast cancer and cervical cancer (see below). Mammography screening for breast cancer aims to detect breast cancer at an early stage, when treatment is most likely to be successful. Pap smear screening aims to detect abnormal cells on the surface of the cervix before they develop into

cancer. Removal of these abnormal cells prevents cancer occurring. Pap smears also detect cervical cancer once it has occurred. Both types of screening have been shown internationally to be cost-effective and to lower death rates.

Prevention

Cancer prevention mainly involves lifestyle changes such as quitting smoking or eating differently. Other measures include vaccination against hepatitis B infection. This is not to say that all cancer is preventable. Even if all environmental risk factors for cancer could be eliminated, it is estimated that 25% of cancers would still occur as a result of spontaneous mutations (Ruoslahti 1996).

In the NT there are public health programs to reduce smoking, decrease excessive alcohol intake and improve diet, which will reduce the occurrence of several types of cancer. Hepatitis B vaccination is universal for all children and adults, and should help reduce the incidence of liver cancer, which is very high among Aboriginal people, particularly males.

Cervical cytology screening

The Pap smear test has been available in Australia for over 30 years, but deaths from cervical cancer have continued to increase. In 1991, the Commonwealth government initiated the National Cervical Screening Program to reduce the incidence of, and illness and death attributable to, cervical cancer. The NT joined the National Cervical Screening Program in 1993. The NT program aims to (THS 1995):

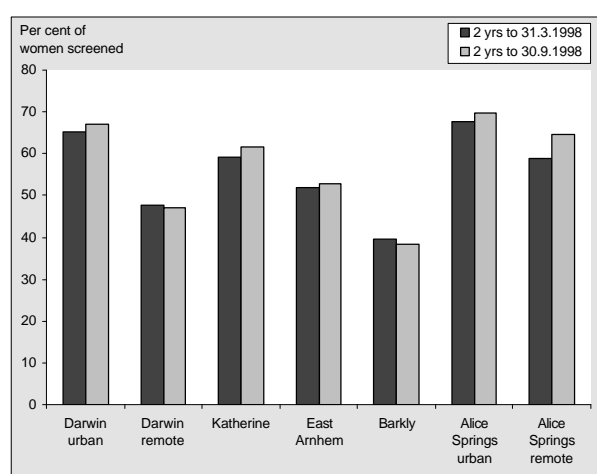
- increase awareness of cervical cancer and Pap smears among women
- increase the number of women having two-yearly Pap smears
- improve screening and follow-up services
- establish cervical cytology registers and recall systems
- educate health professionals about cervical cancer prevention techniques

In the NT, older women, Aboriginal women and women from non-English speaking backgrounds have been identified as high priority groups. Special initiatives for Aboriginal women in NT remote communities have included the implementation of Well Women's Screening, which has seen Pap smear screening rates increase in remote communities—in some places to levels comparable with those in urban areas (see graph 11.1).

The NT Pap smear register started collecting data in March 1996. The register reminds women and their usual health care professional when they are overdue for their next Pap smear or follow-up treatment. The register provides statistics on the number of women having Pap smears, and the effectiveness of Pap smear testing and follow-up. These statistics are used to monitor the performance of the program.

At the end of 1997, 32,217 women were registered on the NT Pap smear register and 40,113 Pap smears had been recorded. In the two years 1996 and 1997, 65% of NT women aged 20 to 69 years had a Pap smear, which is similar to the national figure (AIHW 1998).

11.1 NT Pap smear screening rates



Note: Proportion of the target population (women aged 20 to 69 years, adjusted for the estimated number of women who have had a hysterectomy) screened at least once during the two-year period

Source: NT Women's Cancer Prevention Program, THS

There are some regional differences in cervical screening rates in the Territory. The NT Women's Cancer Prevention Program reports that in 1996 and 1998 urban centres had screening rates of 66% to 68%, but in remote areas screening rates ranged from 47% to 60% (graph 11.1). Cultural and communication factors, the availability of adequate primary care facilities, and access to and use of follow-up services are all important factors in improving Aboriginal women's use of Pap smear screening.

Early detection

Cancer cells multiply to an enormous number before they become detectable, and even more so before they cause symptoms. If early detection is feasible, and early treatment makes a difference to outcome by reducing suffering, deaths and costs, then screening for that particular cancer is justified.

Colorectal cancer screening

Colorectal cancer screening by testing for blood in faeces (stools or bowel movements) has been shown, in randomised controlled trials, to reduce death (Weller 1998). The feasibility of a national screening program for the early detection of colorectal cancer, by testing for small, invisible amounts of blood in the faeces, is being considered.

Prostate cancer screening

Prostate cancer screening through measurement of prostate specific antigen (a blood marker for prostatic cancer) has not been shown to influence death, and its use for population screening is not recommended by Australian and international medical authorities. However, such testing may be appropriate for finding cases of prostate cancer in high-risk groups, such as those with a family history of prostate cancer (Ward 1998).

Breast cancer screening

BreastScreen Australia is a Commonwealth government initiative that aims to reduce deaths from breast cancer among women over 50 years of age by increasing early detection. Screening mammography is recommended every two years to detect unsuspected cancer at an early stage so that early treatment can reduce illness and death from breast cancer (AIHW 1998). The NT joined BreastScreen Australia in 1994.

In 1999, mammography screening was available to Territory women in urban centres (Darwin, Alice Springs, Tennant Creek, Katherine and Nhulunbuy) but not in more remote areas. This is partly because of logistical reasons and the low incidence of breast cancer in NT Aboriginal women.

To reduce death rates sufficiently to justify the cost of breast cancer screening, 70% of women aged 50 to 69 years need to participate. Women aged 40 to 49 years, and 70 years and over, are eligible to participate, but they are not encouraged to do so as there is no clear evidence that screening women of these ages reduces death rates.

In 1996 and 1997, 3,800 women aged 50 to 69 years, or 49% of those eligible, were screened by BreastScreen NT (AIHW 1998) compared to the national percentage of 52%. In 1997, 12 cases of breast cancer were detected by BreastScreen NT, nine of which were in women aged 50 to 69 years, the target age group.

NT Aboriginal women are not participating in screening to the same extent as NT non-Aboriginal women. From the start of BreastScreen NT to the end of March 1999, 5,764 women aged 50 to 69 years were screened, only 541 or 9% of whom were Aboriginal.

Optimal management

Optimal management of cancer involves many medical and other professional disciplines. It is enhanced by the development of treatment guidelines, which have been shown to improve the outcome for people with cancer. Access to multidisciplinary care is an important issue in regional centres, where the full range of specialist services is often not available.

Apart from complex surgical and chemotherapy treatments and radiotherapy, all cancer treatments

are available in Royal Darwin and Alice Springs hospitals. To optimise management of cancer when specialist expertise is not available locally, links have been established between NT hospitals and major cancer centres interstate. One such link is between the Royal Darwin Hospital and the Cancer Centre at the Royal Adelaide Hospital. Doctors and other staff in both hospitals participate in regular cancer management meetings to discuss individual cases through a video-conferencing link. A backup system of management protocols, interactive education sessions and updates on information are also provided.

Nationally, treatment guidelines continue to be developed, and existing guidelines improved, to assist in the management of common cancers. In the Territory, work is directed towards improving primary care facilities, understanding and overcoming communication and cultural barriers, and overcoming the tyrannies of distance.

11.2 NT cancer incidence 1987 to 1997

Site	Male			Female		
	NT Aboriginal	NT non-Aboriginal	Australia	NT Aboriginal	NT non-Aboriginal	Australia
Bladder	10.1	12.3	14.5	2.3	4.2	4.1
Bone	2.8	3.7	4.0	0.6	1.8	2.4
Brain	5.1	4.7	6.3	1.3	4.7	4.6
Cervical	—	—	—	31.4	13.9	10.0
Colorectal	16.6	43.8	45.5	8.0	36.2	32.0
Breast (female)	—	—	—	22.9	67.5	70.0
Kidney	0.8	8.9	8.8	1.6	5.6	5.2
Larynx	5.3	11.0	5.1	0.0	1.5	0.5
Leukaemia	5.1	6.8	9.9	8.3	3.5	6.5
Mouth (lip, tongue, oral cavity)	21.8	23.2	17.0	7.9	6.8	5.5
Liver	26.4	3.5	2.7	5.9	1.4	0.8
Lymphoma	2.8	11.2	14.9	5.0	9.2	10.2
Melanoma	5.6	30.0	31.9	1.4	21.4	26.2
Stomach (including oesophagus)	13.7	14.3	15.3	6.6	7.0	6.5
Ovary and uterine adnexa	—	—	—	6.2	9.4	8.8
Pancreas	16.2	5.6	6.4	4.1	5.6	4.5
Prostate	17.0	56.1	62.0	—	—	—
Testis	1.3	4.9	4.4	—	—	—
Thyroid	3.4	0.8	1.4	9.5	3.3	4.0
Lung (incl. trachea & bronchus)	76.1	60.5	46.1	38.8	25.0	15.0
Uterus	—	—	—	6.8	9.0	10.0
Unspecified sites	30.1	17.7	13.4	24.3	10.6	9.2
Others	15.5	11.5	18.2	22.3	9.1	27.7
All cancers	275.7	330.5	328.0	215.2	256.8	263.6

Notes: Age-adjusted incidence (new cases) per 100,000 people, standardised to 1980 world standard population
Australia—1987 to 1994 data
'Unspecified sites' means cancers where the primary site is unknown

Source: Epidemiology Branch, THS

Cancer in Territorians

Cancer data are collected by cancer registries in each State and Territory, which regularly publish cancer statistics. Data are also sent to the National Cancer Statistics Clearing House, operated by the Australian Institute of Health and Welfare, which publishes national cancer statistics. This allows identification of priority areas for cancer control and helps to direct cancer research. Other than melanomas, cancer registries do not record cases of skin cancer as they very rarely cause death and it is much more difficult to collect reliable data about them.

Because the NT population is small, there is considerable fluctuation in the number of new cases (incidence) of cancer from year to year. This makes reliable identification of trends difficult. For this reason, in the following section, NT cancer statistics are combined for the years 1987 to 1997. The term

‘unspecified sites’ refers to cancers that are diagnosed late, when metastases have spread from the cancer’s original location and the primary site cannot be identified. The incidence of this is high among Aboriginal people, perhaps because under-investigation means the primary cancer is identified less frequently.

From an analysis of the NT Cancer Register, the incidence (the number of new cases expressed as a rate) of cancer in non-Aboriginal Territorians is similar to that of all Australians, whereas the incidence in Aboriginal Territorians is slightly lower (table 11.2).

Cancer death rates for non-Aboriginal Territorians are similar to Australian rates, but for Aboriginal Territorians they are much higher (table 11.3). This may be a result of late diagnosis and treatment of cancer, and decreased uptake of treatment by Aboriginal people—partly because of cultural reasons, lower adherence to treatment regimens, language and

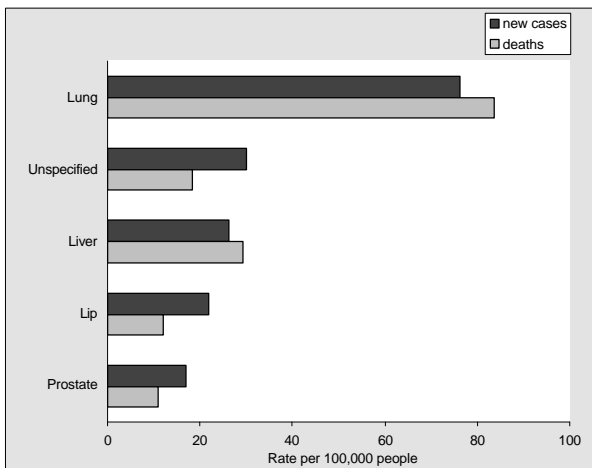
11.3 NT cancer death rates 1987 to 1995

Site	Male			Female		
	NT Aboriginal	NT non-Aboriginal	Australia	NT Aboriginal	NT non-Aboriginal	Australia
Bladder	5.5	5.0	4.2	2.8	1.7	1.3
Bone	0.0	0.6	1.5	1.6	0.4	1.0
Brain	2.7	3.2	5.0	3.3	1.8	3.4
Cervical	—	—	—	27.6	3.2	2.9
Colorectal	9.5	16.7	20.4	10.2	14.1	14.0
Breast (female)	—	—	—	12.5	15.5	20.4
Kidney	1.9	1.7	3.7	0.8	2.6	2.2
Larynx	4.7	5.3	2.0	0.0	0.8	0.2
Leukaemia	8.6	1.2	5.9	4.3	2.3	3.7
Mouth (lip, tongue, oral cavity)	11.9	7.2	4.5	3.0	3.6	1.3
Liver	29.2	2.7	2.8	7.9	1.4	1.1
Lymphoma	2.7	2.6	6.5	3.8	1.5	4.3
Melanoma	3.0	6.3	5.0	2.6	1.0	2.4
Stomach (including oesophagus)	11.2	8.9	11.8	5.5	3.5	4.9
Ovary and uterine adnexa	—	—	—	4.0	4.8	5.5
Pancreas	13.3	5.9	6.5	5.2	2.9	4.6
Prostate	10.8	17.5	17.6	—	—	—
Testis	0.7	0.2	0.3	—	—	—
Thyroid	3.2	0.9	0.3	0.8	0.4	0.3
Lung (incl. trachea & bronchus)	83.6	51.4	41.6	33.7	21.0	12.9
Uterus	—	—	—	5.1	1.4	1.7
Unspecified sites	18.2	9.0	9.2	15.3	5.9	6.4
Others	10.6	5.3	7.6	13.6	5.1	5.4
All cancers	231.5	151.6	156.4	163.7	95.2	100.0

Notes: Age-adjusted death rates per 100,000 people, standardised to 1980 world standard population
‘Unspecified sites’ means cancers where the primary site is unknown

Source: Epidemiology Branch, THS

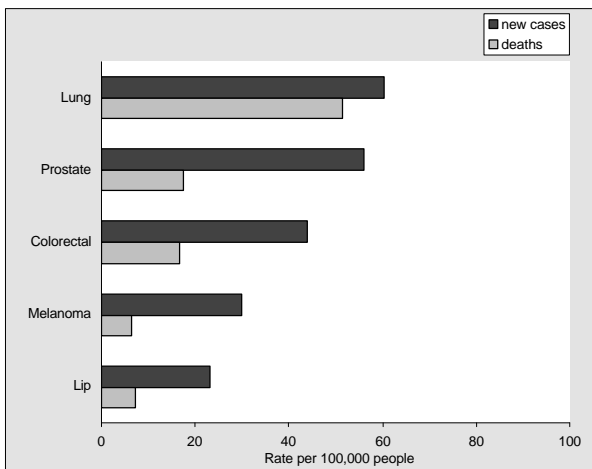
11.4 Most common cancers: NT Aboriginal males 1987 to 1997



Notes: Average annual age-adjusted incidence (new cases) and death rates per 100,000 people, standardised to 1980 world standard population
 'Unspecified sites' means cancers where the primary site is unknown
 Death rates occasionally exceed incidence rates because of the different time periods: incidence is 1987 to 1997 data; death rates are 1987 to 1995 data

Source: Epidemiology Branch, THS

11.5 Most common cancers: NT non-Aboriginal males 1987 to 1997



Notes: Average annual age-adjusted incidence (new cases) and death rates per 100,000 people, standardised to 1980 world standard population
 'Unspecified sites' means cancers where the primary site is unknown
 Incidence is 1987 to 1997 data; death rates are 1987 to 1995 data

Source: Epidemiology Branch, THS

other communication problems, and factors such as distance and isolation which impact on access to medical services.

For NT males, between 1987 and 1997, lung cancer was the most common type of cancer and the most common cause of cancer death (graphs 11.4 and 11.5). The next most common cancers were:

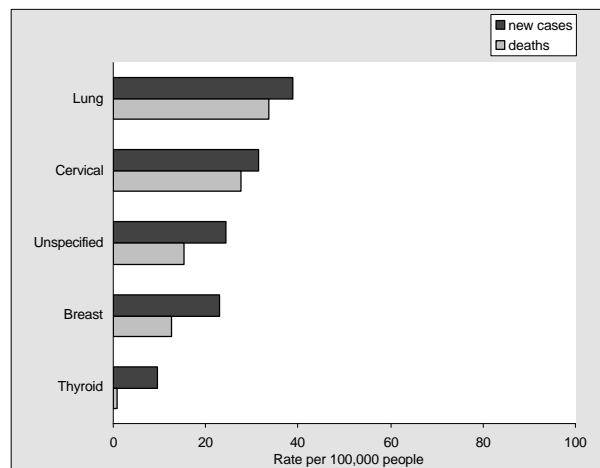
- for Aboriginal males, 'unspecified site' and primary liver cancer

- for non-Aboriginal males, prostate and bowel cancer

Lung cancer was also the most common type of cancer, and most common cause of cancer death, in NT Aboriginal females between 1987 and 1997 (graph 11.6). Next most common were cervical cancer and cancer of 'unspecified sites'.

In NT non-Aboriginal females, breast cancer was the most common type of cancer, followed by bowel

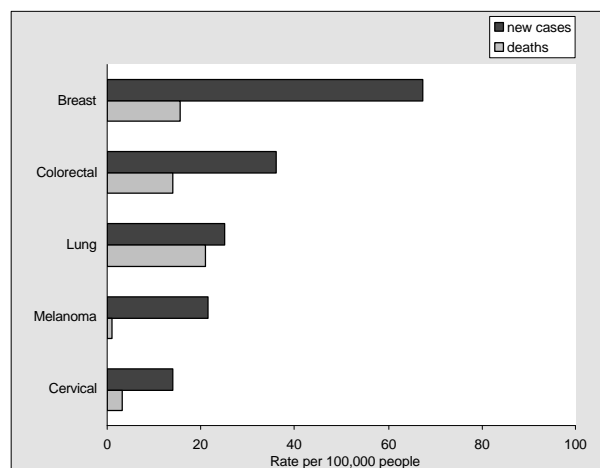
11.6 Most common cancers: NT Aboriginal females 1987 to 1997



Notes: Average annual age-adjusted incidence (new cases) and death rates per 100,000 people, standardised to 1980 world standard population
 'Unspecified sites' means cancers where the primary site is unknown
 Incidence is 1987 to 1997 data; death rates are 1987 to 1995 data

Source: Epidemiology Branch, THS

11.7 Most common cancers: NT non-Aboriginal females 1987 to 1997



Notes: Average annual age-adjusted incidence (new cases) and death rates per 100,000 people, standardised to 1980 world standard population
 'Unspecified sites' means cancers where the primary site is unknown
 Incidence is 1987 to 1997 data; death rates are 1987 to 1995 data

Source: Epidemiology Branch, THS

cancer and lung cancer. The most common causes of cancer death were lung cancer, followed by breast and bowel cancers (graph 11.7).

Lung cancer

Lung cancer is the most common type of cancer in the NT (see table 11.2). Death rates from smoking-related cancers are higher in the NT for both males and females compared with Australian rates (see table 11.3).

Reductions in smoking take 10 to 20 years to affect smoking-related cancer incidence because of the long lead time between smoking and the development of cancer. Australia-wide, lung cancer is becoming less frequent in males, and increasing in females as the proportion of females who smoke increases (AIHW & AACR 1998). Smoking surveys have shown that the Northern Territory has one of the highest reported levels of current and ex-smokers. In 1995, 50% of the NT adult population were either current or ex-smokers; only Tasmania had a higher level (57%) (ABS 1997) (see the Substance misuse chapter).

Cervical cancer

Cervical cancer incidence and death are high in the Territory, especially among Aboriginal women (see tables 11.2 and 11.3). Incidence and especially death have continued to decrease in the rest of Australia (AIHW 1998), largely due to the effects of organised screening which has been in place since 1991.

In the years 1987 to 1997, cervical cancer incidence and death rates for NT women were higher than national rates. While incidence and death rates among non-Aboriginal Territorians were slightly higher than Australian rates, the incidence for Aboriginal women was three times higher, and the death rate nine times higher, than for Australian women generally (Epidemiology Branch, THS).

NT non-Aboriginal women had a very good chance of surviving cervical cancer, compared with the chance of survival for NT Aboriginal women. In the NT between 1987 and 1997 (Epidemiology Branch, THS):

- 86 non-Aboriginal women were diagnosed with cervical cancer in the NT, but only 12 died
 - 53 Aboriginal women were diagnosed, and 32 died.
- Lower screening rates among NT Aboriginal women before the advent of organised cervical screening almost certainly contributed to these high rates.

Organised screening began in the Territory in 1994, and the Cervical Cytology Register was fully functional by 1996. Following an initial increase in the number of cases diagnosed (because screening detects existing cervical cancers in women who have never been screened and who have had no symptoms), there should be a decrease in both incidence and death from cervical cancer in the NT. Whether this actually occurs will be able to be established once the register has been operating for long enough to provide the required data.

Prostate cancer

The incidence of prostate cancer has risen considerably in Australia, largely as a result of the widespread use of prostate specific antigen testing. It is now the most commonly diagnosed cancer in Australia, but recent decreases in the incidence of prostate cancer indicate that this trend is declining because prostate specific antigen testing has resulted in the diagnosis of very small, early cases (AIHW & AACR 1998).

The slightly lower incidence of prostate cancer in non-Aboriginal NT males compared with the rest of Australia (see table 11.2) is probably best explained by the slower uptake of prostate specific antigen testing in the NT. The NT Cancer Registry found that the incidence of prostate cancer in non-Aboriginal Territorians increased from 1987 to 1997. In the NT, the incidence of prostate cancer in Aboriginal males is half that in non-Aboriginal males.

Breast cancer

Breast cancer incidence in the Territory is low compared with the rest of Australia because of the low incidence of breast cancer in Aboriginal women (see table 11.2). The reason for this is unclear; it may be either a true low incidence (that is, Aboriginal women are less likely to get breast cancer) or a lower rate of diagnosis. The former seems more likely, and would be consistent with the high fertility, early age of first pregnancy and high level of breastfeeding of NT Aboriginal women. In non-Aboriginal women in the Territory, breast cancer incidence is similar to the rest of Australia.

Liver cancer

There is a high incidence of primary liver cancer in Aboriginal males in the Territory, comparable to rates in high incidence areas internationally. Primary liver

cancer is the third commonest cancer (see graph 11.4) and the second highest cause of cancer death among NT Aboriginal males. In the Territory, the cause of most liver cancer is thought to be cirrhosis from any cause or hepatitis B infection. Aflatoxins are a recognised cause of primary liver cancer, but their importance as a cause of liver cancer in the NT is unknown.

Chronic hepatitis B infection in NT Aboriginal adults was found to be high (averaging 13.1%) compared with other sections of the NT population in several studies between 1971 and 1989. Of Aboriginal patients with primary liver cancer in the NT, 64% have evidence of chronic hepatitis B infection (Wan & Mathews 1994). Most of these patients are diagnosed at a late stage of their illness and, because the only potential for improved outcome is early detection and surgery, few patients survive.

Screening for primary liver cancer has been shown to be useful in other countries. However, the value of screening at-risk Aboriginal males in the Territory is unclear. The logistics and costs of organising regular blood and ultrasound tests are significant, and there is doubt whether death rates would fall significantly. However, overseas evidence shows that hepatitis B vaccination is effective in the prevention of liver cancer (Sung 1997).

Melanoma

Melanoma is a cancer in darkly pigmented cells, primarily of the skin. The risk of primary melanoma is highest in people with light skin and high sun exposure. Compared with the rest of Australia, melanoma rates are lower in the Territory because of the low rates of melanoma in Aboriginal people. When Aboriginal people do get melanoma, it usually occurs in non-pigmented areas such as the palms, soles and mucosal surfaces (the lining of the mouth and nose, for example).

Colorectal cancer

NT non-Aboriginal colorectal cancer incidence and death rates are similar to those Australia-wide (see tables 11.2 and 11.3). NT Aboriginal colorectal incidence is significantly lower. The reason for this remains unclear. One could speculate whether dietary factors from over 20 years ago may have had a part to play. Now that many Aboriginal people consume a

western-influenced diet, one might expect their incidence of colorectal cancer to increase in years to come.

References

- ABS 1997, *National Health Survey: Summary Results, Australian States and Territories*, cat no 4368.0, Canberra.
- AIHW 1998, *Breast and Cervical Cancer Screening in Australia 1996–1997*, Cancer series No 10, AIHW cat no CAN-3, Canberra.
- AIHW & AACR 1998, *Cancer in Australia 1991–1994 (with Projections to 1999)*, Cancer Series No 7, AIHW cat no CAN2, Canberra.
- Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory, 1979 to 1997*, THS, Darwin.
- English DR, Holman CDJ, Milne E and others 1995, *The Quantification of Drug Caused Morbidity and Mortality in Australia*, 2 vols, AGPS, Canberra.
- H&FS 1998, *Cancer Control towards 2002: The First Stage of a Nationally-Coordinated Plan for Cancer Control*, National Cancer Control Initiative, Canberra.
- H&FS & AIHW 1998, *National Health Priority Areas Report on Cancer Control 1997*, AIHW cat no PHE 4, Canberra.
- Ruoslahti E 1996, 'How cancer spreads', *Scientific American*, vol 275, no 3, pp 72–7.
- Sung JL 1997, 'Prevention of hepatitis B and C virus infection for prevention of cirrhosis and hepatocellular carcinoma', *Journal of Gastroenterology and Hepatology*, vol 12, pp 9–10.
- Trichopoulos D, Li FP & Hunter DJ 1996, 'What causes cancer', *Scientific American*, vol 275 no 3, pp 80–7.
- THS 1995, *The NT cervical screening program: NT plan 1995–96 to 1998–99* (unpublished), Women's Cancer Prevention Program, Darwin.
- Wan X & Mathews JD 1994, 'Primary hepatocellular carcinoma in Aboriginal Australians', *Australian Journal of Public Health*, vol 18, no 3, pp 286–90.
- Weinberg RA 1996, 'How cancer arises', *Scientific American*, vol 275, no 3, pp 62–70.
- Weller D 1998, 'Colorectal cancer screening in Australia—where to now?', *Cancer Forum*, vol 22, no 1, pp 15–8.
- Ward J 1998, 'Prostatic cancer screening, too much, too soon', *Cancer Forum*, vol 22, no 1, pp 18–23.
- Scientific American 1996, 'What you need to know about cancer', *Scientific American*, special issue, vol 275, no 3.

The health of particular groups

Children's health and welfare

by Barbara Paterson, Karen Edmond, Kate Kennedy and Tina McKinnon (Child health), Helen Crawford (Children's development), Colin Dyer and Bronwyn Thompson (Child abuse and neglect) and Jenny Scott (Children in out-of-home care and Adoptions)

This chapter summarises the health status of children in the NT and some aspects of their welfare, including the role of child care services in children's development, the problems of abused or neglected children, and data about children who need to be placed in temporary care or adopted.

Child health

This section provides a snapshot of the health of children under 15 years living in the NT in the 1990s. In summary:

- the health of children is improving in the NT
- the gap between the health of Aboriginal and non-Aboriginal children remains large
- malnutrition remains a serious health problem for a large proportion of NT Aboriginal children
- more children die or are hospitalised because of injuries or poisoning than from any other cause

In 1996, children aged under 15 years were 27% of the NT population (49,330 children) compared with 21% of the Australian population. Children under 15 years comprised 38% of the NT Aboriginal population and 23% of the NT non-Aboriginal population (d'Espaignet & others 1998). From 1985 to 1995, there was a 10% increase in the number of live births in the NT (Markey & others 1998).

The health of children is affected by events during pregnancy and birth, biological disease, the physical environment and socioeconomic factors. The most important influences are the family environment and the parenting skills of the child's carers. Children need love, care, commitment, consistency and stimulation for normal development and good health (Hoghugh & Speight 1998).

Healthy children grow into healthy adults. There is much evidence linking low birthweight and poor nutrition in early childhood with chronic diseases, such as heart disease, kidney disease and diabetes, in adult life (Barker & others 1993; Hoy & others 1996). Evidence also links recurrent infectious disease in childhood with severe adult respiratory problems.

Childhood is a time when the foundations are laid for healthy living, good eating habits and regular exercise.

Data about children who die and those who are hospitalised indicate the extent of severe disease but provide little information about milder illnesses treated by the family doctor or by parents themselves. Children's use of health services depends on the state of their health, but also on their carers having the time, knowledge and motivation to take them to health services.

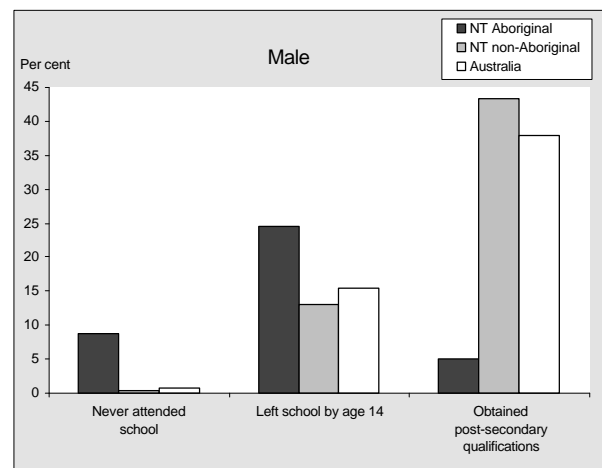
Factors influencing child health

Important factors that influence child health include education, family structure, housing, aspects of mothers' health, immunisation and breastfeeding.

Education

Level of education is closely linked to health status. Education enables people to have greater control over their lives, to make informed decisions about their health and increases their employment possibilities and earning ability. Parental education, especially maternal educational level, has the most influence on child health outcomes (World Bank 1993).

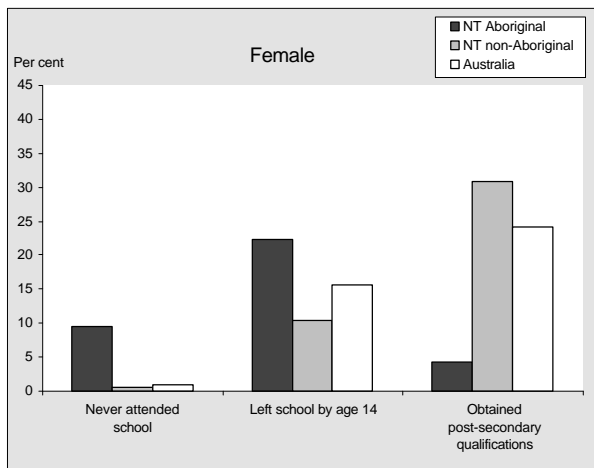
12.1 NT male educational levels 1996



Note: Total NT population 15 years and over

Source: Adapted from d'Espaignet & others 1998

12.2 NT female educational levels 1996



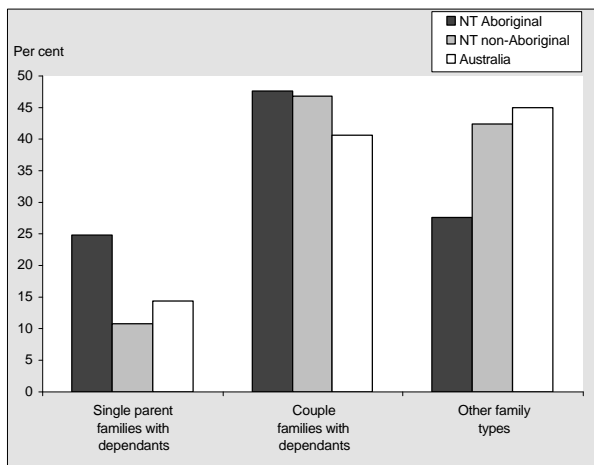
Note: Total NT population 15 years and over

Source: Adapted from d'Espaignet & others 1998

In the NT in 1996 (graphs 12.1 previous page and 12.2):

- almost all non-Aboriginal people aged over 15 years had received some schooling
- almost 10% of Aboriginal people had never attended school
- females tended to remain at school longer than males, but were less likely to obtain post-secondary school qualifications

12.3 Families 1996



Note: 'Single-parent families' mean one parent and their children plus relatives who have no spouse or child of their own and live in the same household

Source: Adapted from d'Espaignet & others 1998

Family structure

Changes in family structure and family breakdown are a symptom of the changing nature of our society.

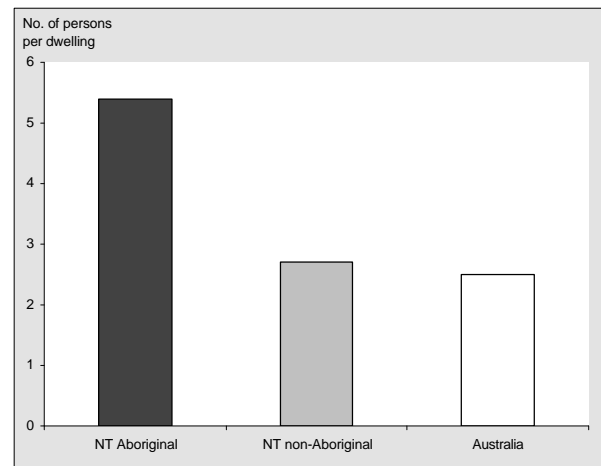
The proportion of single-parent families in the NT was 2.3 times greater among the NT Aboriginal people (25%) than among NT non-Aboriginal people (11%) (graph 12.3).

Children of single-parent families may be disadvantaged in health outcomes and educational attainment (Mathers 1995).

Housing

Adequate housing is required to meet the basic human need of shelter. Overcrowding increases the risk of disease and ill health because it causes increased stress on relationships, increased risk of infectious diseases such as pneumonia and rheumatic fever and increased use and breakdown of toilets, water and sewage.

12.4 Number of persons per dwelling 1996



Note: Average number of persons per dwelling

Source: Adapted from d'Espaignet & others 1998

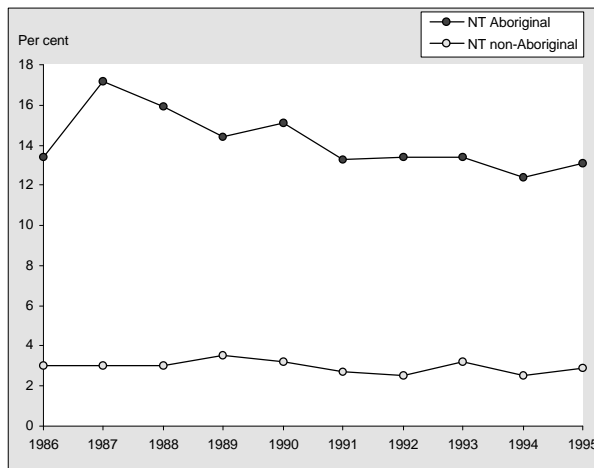
In the NT in 1996, Aboriginal homes had twice as many occupants as non-Aboriginal homes (graph 12.4). 31% of Aboriginal households in the NT had two or more persons per bedroom compared with less than 2% of non-Aboriginal homes (d'Espaignet & others 1998).

Aspects of mothers' health that affect child health

Number of births

The number of children a woman gives birth to (parity) affects the health of both mother and child. The reasons for this are complex and may include physical strain, economic cost and limited time available for the mother to bond with her child.

12.5 NT parity 1986 to 1995



Note: Proportion of mothers having had four or more children

Source: Adapted from Markey & others 1998

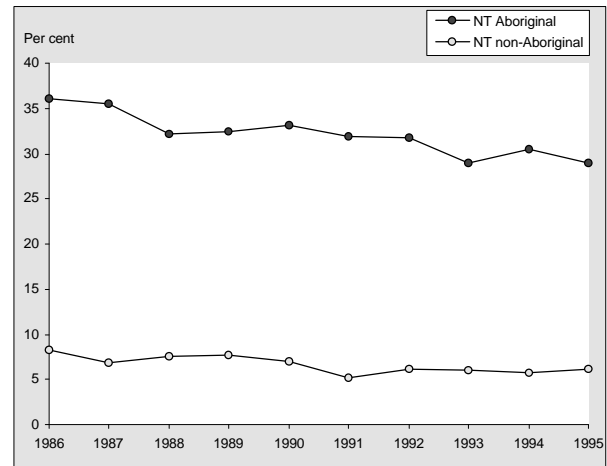
In 1995, the proportion of mothers who had had four or more babies was four times higher among NT Aboriginal mothers (13%) than among non-Aboriginal mothers (3%) (graph 12.5).

Young mothers

A mother aged less than 20 years stands a higher chance of medical complications for both herself and her child (Markey & others 1998).

The proportion of teenage Aboriginal mothers in the NT decreased from 36% to 29% between 1986 and 1995 (graph 12.6). Nevertheless, the proportion of teenage mothers was almost five times greater for Aboriginal women than for non-Aboriginal women (6%) in the NT in 1995 (Markey & others 1998).

12.6 NT mothers aged less than 20 years 1986 to 1995

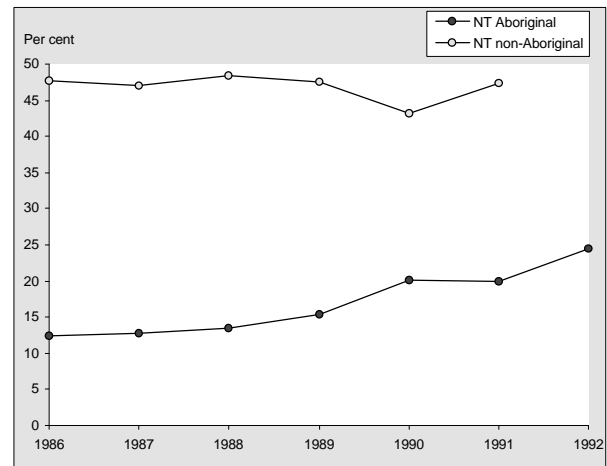


Source: Adapted from Markey & others 1998

Antenatal care

Women who attend antenatal care early have fewer complications and better health outcomes. This is primarily because early attendance assists with early detection and treatment of medical problems.

12.7 NT antenatal care 1986 to 1992



Notes: Mothers receiving antenatal care in the first three months of pregnancy
1992 data for non-Aboriginal mothers excluded because of the high proportion of unreported data in that year

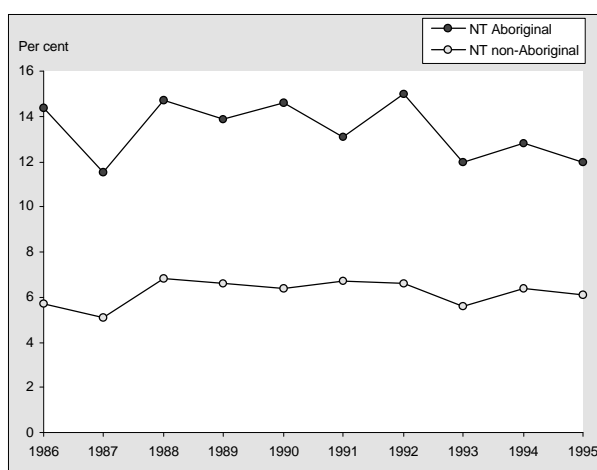
Source: Adapted from Markey & others 1998

The proportion of NT Aboriginal women who attended antenatal care in the first 12 weeks of their pregnancy increased from 12% in 1986 to 25% in 1992 (graph 12.7). Despite this improvement, considerably more non-Aboriginal women in the NT attend antenatal care before 12 weeks than Aboriginal women.

Premature birth

Factors that indicate a mother is more likely to give birth before 37 weeks of pregnancy (preterm delivery) include: smoking, maternal infections, maternal educational level and low socioeconomic status. Premature birth is associated with complications, such as breathing problems, that require intensive care and involves a higher risk of perinatal and infant death (d'Espaignet & others 1998).

12.8 NT premature births 1986 to 1995



Note: Proportion of mothers delivering before 37 weeks (preterm delivery)

Source: Adapted from Markey & others 1998

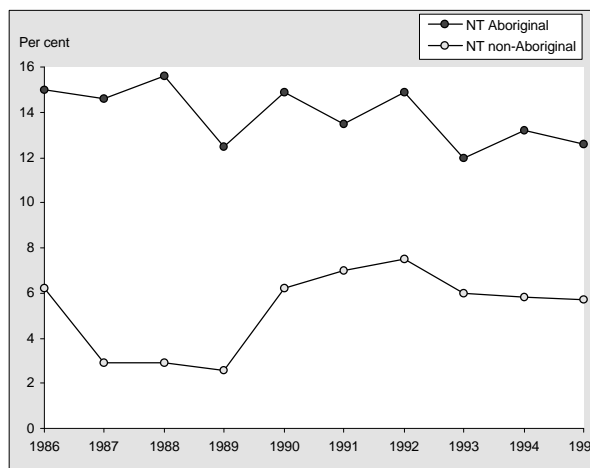
In the NT, the proportion of mothers who delivered their baby before 37 weeks was constant during the ten years to 1995: approximately 12% in Aboriginal mothers and 6% in non-Aboriginal mothers (graph 12.8).

Low birthweight

Babies who weigh less than 2,500 grams at birth are more likely to have complications than those in the normal weight range (2,500 to 4,000 grams at birth). There are also strong links between low birthweight and adult chronic disease (Barker & others 1993; Hoy & others 1996).

The proportion of babies who weigh less than 2,500 grams at birth is decreasing in the NT. However, approximately twice as many babies of low birthweight were born to Aboriginal than non-Aboriginal mothers in 1995 (13% compared with 6%) (graph 12.9).

12.9 NT babies of low birthweight 1986 to 1995



Note: Proportion of live births with a birthweight of less than 2,500 grams

Source: Adapted from Markey & others 1998

Other Factors

Immunisation is an effective way of preventing disease and death from infections such as measles, diphtheria and meningitis. Immunisation rates are much better in the NT than in Australia overall. For more information, see the Communicable diseases chapter.

Breastfeeding provides nourishment, protects babies from infectious disease and is a great psychological benefit to both the mother and child. Breastfeeding also protects infants and children against respiratory illnesses (Wilson & others 1998). A higher proportion of mothers in the Territory breastfeed their babies than in Australia overall. For more information, see the Food and nutrition chapter.

The mouth and teeth are a very important part of child health. Painful and unsightly teeth may result in poor nutritional intake and low self-esteem. For more information, see the Dental health chapter.

Alperstein & others (1996) identified drug use in the family environment as having a serious impact on child health. Parents' capacity to pay for food, clothing and services that benefit children is diminished by spending money on drugs, a matter that impacts particularly on low-income families. Drinking alcohol changes people's behaviour, and is known to increase the risk of both domestic violence and child abuse (Cummings & Katona 1995; Keys Young 1994). Children who live with smokers have an increased risk of respiratory (chest) infections (Lister & Jorm 1998).

Child deaths

12.10 NT child deaths 1981 to 1997

Year	Aboriginal				Non-Aboriginal			
	0-4 yrs		5-14 yrs		0-4 yrs		5-14 yrs	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1981	44	1,001.1	12	137.5	29	321.3	6	34.3
1982	42	914.2	9	98.1	26	277.0	5	27.3
1983	46	967.3	7	74.6	14	144.8	6	32.1
1984	26	518.6	7	73.1	21	207.2	6	31.5
1985	47	906.5	7	71.7	36	345.2	3	15.5
1986	41	697.5	7	72.2	20	201.7	5	25.6
1987	47	781.9	8	82.4	19	188.6	6	30.5
1988	40	650.8	8	81.1	17	168.7	3	15.5
1989	37	600.5	5	49.5	23	224.6	5	26.2
1990	44	720.1	10	96.1	22	209.7	1	5.3
1991	40	624.1	8	74.5	23	227.6	3	15.9
1992	41	633.5	4	36.2	22	213.4	2	10.6
1993	41	625.7	3	26.4	15	144.7	4	21.2
1994	37	560.2	7	59.9	14	133.7	4	21.1
1995	25	375.8	6	50.2	24	222.6	2	10.5
1996	38	566.8	6	49.3	15	134.1	3	15.7
1997	36	531.2	5	40.4	10	89.2	4	20.4

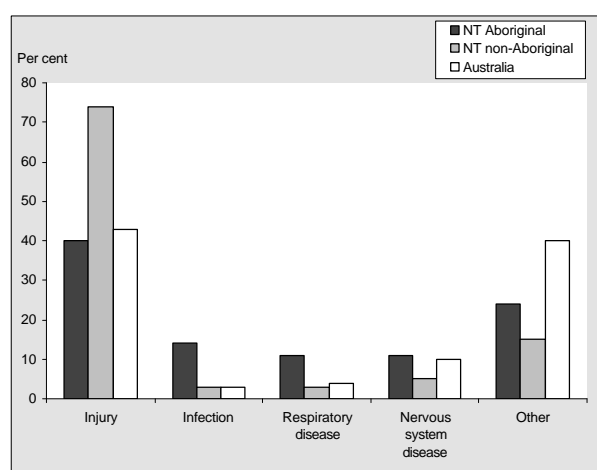
Note: Age-specific death rates per 100,000 people

Data: Epidemiology Branch, THS

Between 1981 and 1997 in the NT, there was a decrease in the number of children who died under 15 years of age (table 12.10).

Causes of child deaths

12.11 NT causes of child deaths 1991 to 1995



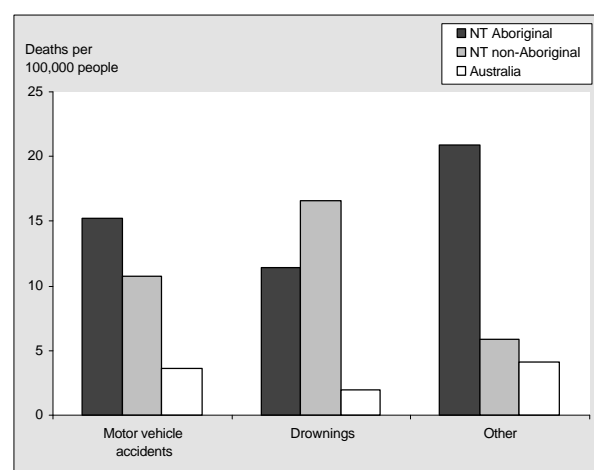
Notes: All NT deaths of children aged between one year and fifteen years
All causes of death coded to the ninth revision of the WHO International Classification of Diseases (ICD-9)

Source: Adapted from d'Espaignet & others 1998

From 1991 to 1995, the main cause of death in children aged between one year and 15 years in the NT was

preventable injury (graph 12.11). Child injury death rates were higher in the NT than in Australia overall.

12.12 NT causes of child injury deaths 1991 to 1995



Notes: NT deaths of children aged between one year and fifteen years
Causes of injury death coded to the ninth revision of the WHO International Classification of Diseases (ICD-9)

Source: Adapted from d'Espaignet & others 1998

Between 1991 and 1995, motor vehicle injuries were the most common cause of injury death in NT Aboriginal children aged one to fifteen years, and

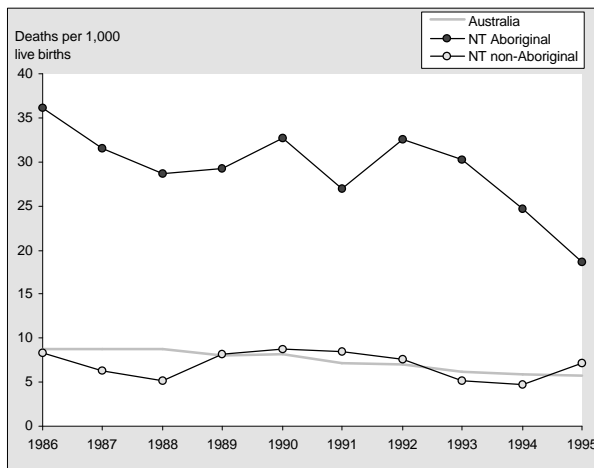
drowning was the main cause of injury death in their non-Aboriginal counterparts (graph 12.12).

A 1995 study found that all the 1985 to 1994 NT motor vehicle and drowning deaths of children aged over one year were completely preventable: all children who died from motor vehicle injuries were unrestrained (that is, they were not wearing a safety belt, or were not in an approved child seat or baby capsule) and all the child drownings occurred in home pools that either had no fencing or fencing which did not meet the Australian standards for swimming pool fences (Silva & others 1998). For more information, see the Injury and violence chapter.

Infant deaths

The number of infant deaths (death in the first year of life) reflects the health, social and living conditions in the NT.

12.13 NT infant death rates 1986 to 1995



Note: Crude death rates per 1,000 live births

Data: NT—Epidemiology Branch THS
Australia—ABS 1986–1995

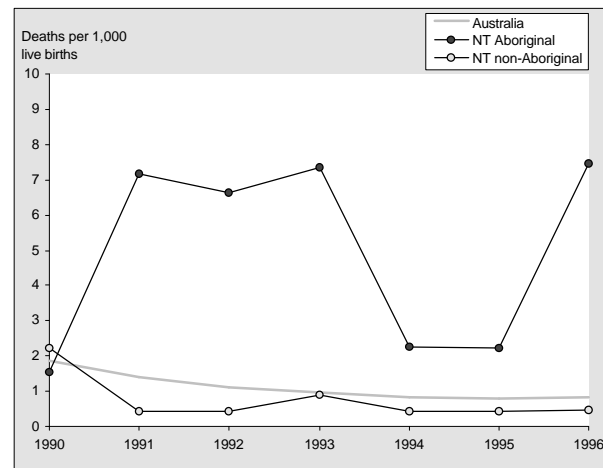
Over the period 1986 to 1995, the infant death rate remained relatively stable in NT non-Aboriginal people but nearly halved in NT Aboriginal people (graph 12.13). Despite this positive decline, NT Aboriginal infants were still two-and-a-half times more likely to die than NT non-Aboriginal infants (Markey & others 1998).

The main causes of NT infant deaths from 1991 to 1995 were (d’Espaignet & others 1998):

- illness during the first 28 days of life, especially respiratory disease and premature birth
- Sudden Infant Death Syndrome (SIDS), also known as cot death
- birth defects (congenital abnormalities)

The Australian SIDS death rate has been falling since

12.14 SIDS death rates 1991 to 1996



Note: ‘SIDS’ means Sudden Infant Death Syndrome, also known as cot death

Data: NT—Epidemiology Branch, THS
Australia—ABS 1990–1996

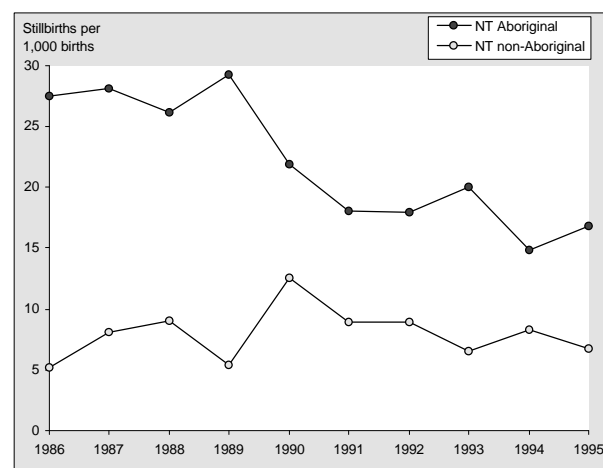
the early 1990s (graph 12.14). However, Aboriginal infants in the NT are still 12 times more likely to die from SIDS than non-Aboriginal infants in the NT (d’Espaignet & others 1998).

National campaigns to prevent SIDS advise that carers of newborn babies should:

- sleep baby on his or her back
- not let baby get too hot
- keep baby in a smoke-free environment during and after pregnancy

Stillbirths

12.15 NT stillbirths 1986 to 1995



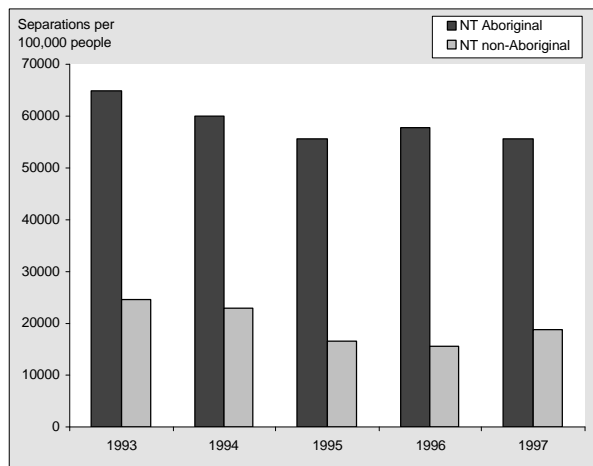
Source: Adapted from Markey & others 1998

Stillbirths fell steadily in the NT over the ten years to 1995, with the NT Aboriginal stillbirth rate falling by about 40% in that time (graph 12.15). This may reflect improvements in the health of mothers and standards of obstetric care.

Children hospitalised

In the NT, children under one year of age are most likely to be hospitalised in the first four weeks of life. These are mainly newborn babies who go into special care nursery units. The major causes of hospitalisation in this age group are respiratory (chest) diseases and infections. For children aged between one and five years of age, respiratory diseases continue to be a leading reason for admission to hospital. This is followed by infections in Aboriginal children and injuries in non-Aboriginal children. The most common reason for admission to hospital for both Aboriginal and non-Aboriginal children aged between five and fifteen years is injury, followed by respiratory disease (d'Espaignet & others 1998).

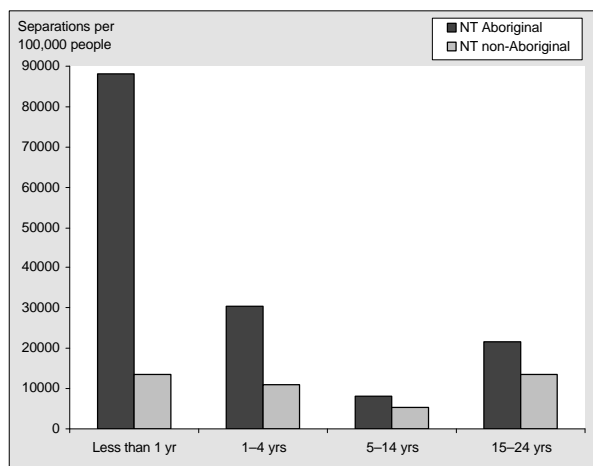
12.16 NT hospital admissions of young children 1993 to 1997



Notes: Children under five years of age
Crude rate of hospital separations (admissions) per 100,000 people

Source: Adapted from Moo S & others 1998 (attachment A)

12.17 NT hospital admissions 1993 to 1997



Note: Age-specific separation (admission) rates per 100,000 people

Source: Adapted from d'Espaignet & others 1998

Fewer children were being hospitalised in the NT from 1993 to 1997 (graph 12.16). This may be because of better health services in the community and the improving health of children.

Younger children were more likely to be hospitalised than older children over the years 1993 to 1997 in the NT (graph 12.17). Aboriginal children under one year of age were nearly seven times more likely to be hospitalised than non-Aboriginal infants.

Specific health problems

Health Goals and Targets for Australian Children and Youth: a Project Report identifies health issues for all Australian children as including physical and other disabilities, learning and behavioural problems, and vaccine-preventable diseases (Jolly & others 1992). The prevalence of these common childhood problems is thought to be the same in the NT as in the rest of Australia.

Health problems that impact more in the NT than in the rest of Australia are: malnutrition, anaemia, gastroenteritis, trachoma, acute rheumatic fever, ear disease and hearing loss. These illnesses have long-term health and social consequences.

Malnutrition

Malnutrition relates to over- or under-nutrition. In NT non-Aboriginal people, there is a trend towards children being overweight ('over-nutrition'). This affects self esteem and increases the risk of later developing chronic diseases such as heart disease, diabetes and cancer.

Under-nutrition occurs mainly in Aboriginal children in the NT. It may result in increased risk of infections, and delayed physical and intellectual development. Long-term under-nutrition may slow bone growth, which results in children being shorter than average (stunting). Short, severe episodes of under-nutrition result in weight loss and being too thin in relation to height (wasting).

Surveys in various NT remote communities in 1995, 1996 and 1997-98 suggested that between 4% and 8% of Aboriginal children under the age of five years were too thin, between 15% and 17% were too short and between 13% and 22% were underweight. Between 1993 and 1997, Aboriginal children aged between one and five years who were admitted to hospital were 120 times more likely to be diagnosed as undernourished than non-Aboriginal children of the same age (d'Espaignet & others 1998).

Anaemia

Anaemia (low blood haemoglobin) is one of the few nutritional deficiencies that occur in developed countries as well as developing countries. Most anaemia in children is related to iron deficiency and is caused by a diet that is low in iron or by 'having worms'—for example, hookworm. Iron deficiency is associated with reduced immunity to infection and delayed physical and intellectual development (Walter 1990; Losoff & others 1991). The effects of early iron deficiency may persist after children start school, affect learning ability and result in poor school achievement (Losoff & others 1991).

No data are available on the prevalence of anaemia in urban areas of the NT. Kruske & others (1999) reported very high prevalence of iron deficiency anaemia in children from NT remote Aboriginal communities. Data obtained from NT remote communities in 1995, 1996 and 1997–98 suggested that about half of all Aboriginal children aged under five years and between 22% and 42% of children aged between six and 11 years were anaemic (d'Espaignet & others 1998).

Gastroenteritis

Gastroenteritis, symptoms of which include diarrhoea and/or vomiting, is caused by bacteria, viruses and parasites that spread rapidly in an unclean or overcrowded environment. It can be prevented by safe water, sewage disposal and food storage, adequate housing and clean personal practices—all of which prevent the spread of disease-causing organisms. Gastroenteritis may result in dehydration and ineffective absorption of nutrients, which in turn cause inadequate weight gain or weight loss.

For the period 1993 to 1997 in the NT, Aboriginal children aged between one and five years were 12 times more likely to be admitted to hospital with a diagnosis of gastroenteritis than non-Aboriginal children of the same age (d'Espaignet & others 1998). For more information, see the Communicable diseases and Environmental health chapters.

Trachoma

Trachoma is a bacterial eye infection (conjunctivitis) that is found mainly in children. It was common throughout Australia during the 19th century, but is now found only in remote parts of the country. Trachoma is associated with dry, dusty environments,

and areas with many flies, poor hygiene and overcrowded housing. If left untreated for many years, trachoma causes scarring of the eyelids and eventually blindness.

Routine screening of NT schoolchildren in remote Aboriginal communities showed that trachoma rates were high (more than 20%) in many communities in the 'cattle country' of Katherine district in 1993 (Paterson & Ruben 1998).

Acute rheumatic fever

Acute rheumatic fever occurs mainly in children, and may cause fever, joint pains and sometimes jerking movements. It is important because it can damage the heart and lead to rheumatic heart disease. It is rare in developed countries but still occurs where people live in overcrowded conditions. Most NT cases of acute rheumatic fever are in Aboriginal people. For more information, see the Communicable diseases chapter.

Hearing loss

Hearing loss has wide implications for the health and wellbeing of individuals and the community. Hearing loss affects communication skills, social development and employment opportunities later in life. If hearing loss is identified early, all of these problems can be prevented.

THS NT Hearing Services data has identified the extent of hearing loss in Territory children:

- data for the ten years from 1988 to 1997 revealed that, in the Top End, 2.24 years was the average age at which permanent hearing loss was first diagnosed and 70% of all children diagnosed with permanent hearing loss had significant risk factors, such as family history, birth defects, trauma or infections early in life (Scott 1998)
- a 1997 survey of children under four years who attended Darwin urban day-care centres found that 48% of children in the study group had middle ear disease (Skull 1999)
- data from 1988 to 1994 indicated that one-third of Aboriginal children in NT remote communities could not hear their teacher in class (NTH&CS 1994c)
- in 1996, screening of all children admitted to the Isolation Paediatric Ward at Royal Darwin Hospital found that 81% had middle ear disease (Secombe 1998)

Child welfare

This section deals with four aspects of the welfare of Territory children:

- child care services, which are discussed in the context of children's development
- child abuse and neglect
- out-of-home care for children who are temporarily unable to live with their immediate family
- adoption

Child care services are generally available to children under 14 years. For the purpose of the other matters discussed, a child is anyone aged under 18 years.

Children's development

Recent research tells us that the first three years of life are critical in determining the life chances of a child. Armstrong (1999) identifies the first three years of an infant's life as 'crucial for the development of a secure sense of attachment to another human being... [it] is the glue that holds us together through life's expectable crises'. Armstrong and others have described the effect on brain development of early neglect, abuse and lack of stimulation, and its lifelong impact.

Early learning experiences, both in the home and the wider community, are important for children's social, emotional and intellectual development. NT services that support young children's development by offering learning activities and parental support include:

- mobile toy libraries, such as the Kidmobile in Central Australia, which travel to rural and remote communities
- kindergartens and playgroups, which provide preschool children with learning opportunities through play

Because preschool education is available to all four-year-olds in the NT, it plays a significant role within the NT's network of child development services. The NT Department of Education collects data on access to sessional preschool education, which is published each year in the *Statistical Overview of Northern Territory Schools*.

Child care services enable parents to participate in work and educational opportunities or take a break from their own child-rearing responsibilities. Good quality child care can assist parents in their caring role, as well as providing a secure and stimulating

environment for children while their parents attend to other duties.

In the NT, as elsewhere in Australia, child care is provided by private or non-profit community-based organisations. Examples of formal child care services include child care centres, Family Day Care and child care for school-age children—that is, before and after school and during school holidays. The NT government provides an operational subsidy to all formal child care centres. Informal child care is provided by family, friends and home-based carers.

Longitudinal research suggests that both the children themselves and society benefit when young children receive good quality child care and child development services. Good quality care can be promoted by the use of minimum standards and quality assurance. The long-term advantages include (see, for example, Ochiltree 1994; Schweinhart & Weikart 1980):

- lower levels of juvenile crime, teenage pregnancy and dependence on social security benefits
- higher levels of school retention and completion, and employment

These benefits, however, are dependent on the quality of the service (Packard & Packard 1995).

In the NT, child care centres are required to meet minimum legislated standards under the *Community Welfare Act* and *Standards: Northern Territory Child Care Centres* (THS 1997). The NT has developed guidelines on child care for school-age children (THS 1999b) and is developing guidelines for home-based care.

Developing child care in the NT

In the NT, traditionally, child care services have been established by community groups in response to local needs and the particular aspirations of community organisations. For example, in the Darwin area in the late 1960s and 1970s, church-sponsored services aimed to provide child care services consistent with their religious values; in Alice Springs in the early 1980s, parents in community-based organisations developed neighbourhood centres that offered a range of developmental and family support services.

Over the years, changes in government policies and funding arrangements have influenced the way in which NT child care services have been developed and provided. In 1971, most child care centres registered in the NT were small, home-based services caring for up to eight children. Twenty-five years later, this had changed significantly: networks of home-

based carers are registered with Commonwealth-funded family child care schemes in urban areas; and more than two-thirds of licensed child care centres care for forty or more children.

In remote areas of the NT over the last 15 years, community groups have been establishing various forms of early childhood services that support the developmental needs of children while enabling their primary carers to participate in the workforce, training or study. Karuwulijawu Ngurra at Yarralin, west of Katherine, and the innovative child care centres at Yuendumu in Central Australia and Nauiyu Nambiyu on the Daly River are among nearly 40 services throughout the Territory that address the needs of remote communities in providing parental support and developmental opportunities for young children.

Access to child care services

Child care is part of a range of child development services that are generally initiated by individuals as private providers or groups within the community. Thus, they may not be available consistently across the NT. Service development may also be stimulated by the availability of government funding.

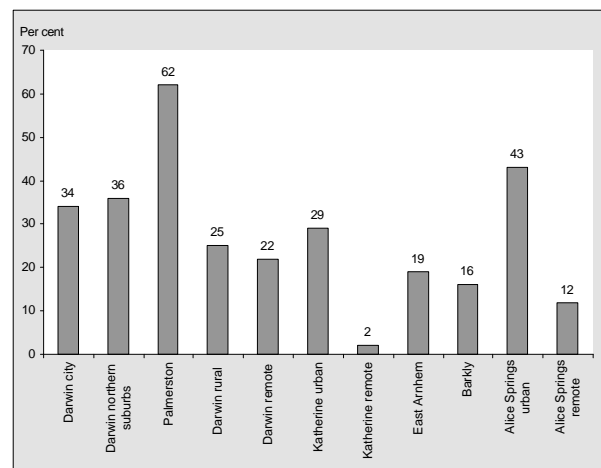
Formal child care

Formal child care services are those that are regulated or funded by the government. Australia-wide, access to formal child care services is measured by a formula that takes account of the number of children aged under five years whose parents are working, training or studying. Thus, changes in workforce participation rates and/or the numbers of children in this age group may significantly impact on these estimates.

In the late 1990s, the federal government considered an access rate of 45% an acceptable level of service provision to meet demand for formal child care (H&FS 1996). The NT government aims to achieve 46% access by 2001. THS estimates of NT access to formal child care were: 29% in 1995–96, based on the 1994 target population; and 33% in June 1998, based on the 1996 target population.

In the NT in 1998, access to formal child care varied significantly between areas: for example, 2% of children in the target population in remote areas outside of Katherine had access compared with 62% in Palmerston, a satellite city near Darwin (graph 12.18).

12.18 NT access to formal child care, 30 June 1998



Notes: The NT target is 46% access by 2001
Access available to children whose parents are in the workforce, seeking employment or in training for employment
Locations are groupings of ABS Statistical Local Areas

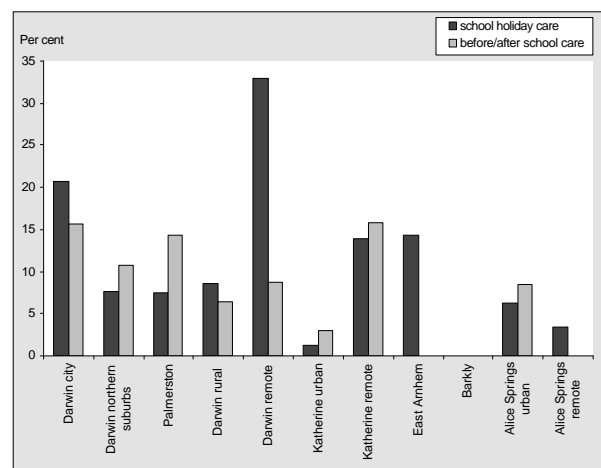
Data: H&FS c1998

A statistical indication of need for formal child care does not necessarily mean that a child care centre is the solution; other forms of care may be more appropriate.

Care for school-age children

Demand for child care services for school-age children is different in that, unlike younger children, school-age children can significantly influence parents' choice of a service.

12.19 NT access to formal care for school-age children August 1998



Notes: Access available to children whose parents are in the workforce, seeking employment or in training for employment
Locations are groupings of ABS Statistical Local Areas

Data: H&FS c1998

In 1998, access to formal care before and after school, and during school holidays varied between areas of the NT, reflecting different community circumstances and needs (graph 12.19). In June 1999, there was no established target for access, although the Commonwealth Department of Family and Community Services estimated the target population at 15,000.

Child abuse and neglect

Child abuse and neglect result in considerable social and economic costs to those abused or neglected and to the wider community. As well as immediate harm and distress, an abused or neglected child may suffer physical and psychological damage that extends throughout their life. This may include learning difficulties and delayed or incomplete development. Abused or neglected children may experience mental health problems (including self-harming behaviour and suicide), substance misuse, teenage pregnancy, youth and adult criminality, long-term unemployment and, as partners and parents, themselves perpetrate domestic violence and child abuse.

In general, child abuse and neglect refer to deliberate injury or harm caused by the actions of parents, caregivers or others known to a child, or their failure to take reasonable steps to prevent harm. Child abuse or neglect is usually not an isolated incident but a pattern of behaviour that occurs over a period of time.

This section discusses child abuse and neglect in the NT in terms of the ongoing safety and wellbeing of children, primarily within the family. It uses the terms physical abuse, physical neglect, emotional abuse and sexual abuse, which are based on the legal definitions in the NT *Community Welfare Act*. This legislation also recognises female genital mutilation as child abuse; however, there were no reported cases in the NT between 1995 and 1999.

The data reported in this section refer to reports of child abuse and neglect made to THS Family and Children's Services during the financial year 1997–98. It is likely that many more instances of child abuse and neglect were not reported.

Child abuse and neglect in the NT: working definitions

Physical abuse

Any deliberate injury or harm, or substantial risk of serious bodily harm, inflicted on a child by their caregiver.

Physical neglect

Any impairment or serious risk to a child's health and development by their caregiver failing to provide adequate food, medical care, clothing, shelter or supervision.

Emotional abuse

Any impairment or threat of impairment to a child's normal physical or emotional development, including disturbed behaviour, which is caused by their caregiver displaying behaviour such as hostility, persistent coldness or rejection.

Sexual abuse

The involvement of a dependent and developmentally immature child or adolescent in the sexual activities of an older person or adult where the younger person is used to satisfy the sexual desires or needs of the older person, or where social taboos or family roles are violated, or where a child's caregiver is unable or unwilling to protect the child from sexual abuse or exploitation.

Adapted from Child protection policy statement (unpublished), NTH&CS, Darwin, 1994.

Reporting of child abuse or neglect

In the NT, anyone who has a reasonable belief that a child has been or is being abused or neglected is required by law to report this to either the police or THS Family and Children's Services staff. In most other states, reporting is mandatory only for certain professionals, such as doctors, teachers and child care workers.

Failing to report child abuse or neglect is an offence punishable by fine in the NT. The *Community Welfare Act* protects from any criminal or civil action a person who makes a report in good faith. This legislation also makes it clear that making a report is not a breach of client confidentiality or a professional's ethics or code of conduct.

12.20 NT reports of child abuse or neglect 1997–98

Source of Report	Finalised Investigations
Subject child	14
Parent or guardian	70
Brother or sister	12
Other relative	55
Friend/neighbour	84
Private medical practitioner	3
Other health	18
Hospital/health centre	69
Social worker	69
School personnel	93
Police	64
Dept officer	0
Non-government organisation	6
Anonymous	34
Other	90
Not stated	2
Total	683

Notes: 'Other' includes 12 child care centre personnel

Source: Family and Children's Services, THS

Data from finalised 1997–98 NT investigations show that the people who reported child abuse or neglect most often were members of the child's immediate or extended family (parents, guardians, brothers, sisters or other relatives), followed by school personnel, friends or neighbours, hospital or health centre staff, social workers, and police officers (table 12.20). The number of reports made by private medical practitioners was very low, particularly given that many family doctors have a high level of contact with children.

Investigation and substantiation of child abuse or neglect

Most reports of child abuse or neglect are investigated by THS Family and Children's Services staff. THS staff and police usually jointly investigate reports of sexual abuse or serious physical abuse: THS staff ensure the child's safety and wellbeing; police determine whether or not there are grounds for laying criminal charges.

In the NT in 1997–98, there were 710 reports of child abuse or neglect involving 615 children. A high proportion of reports was investigated and finalised (96%).

In 1997–98, based on the estimated population at 30 June 1997, the NT rates of substantiated child abuse or neglect were 7.9 per thousand for Aboriginal children aged under 15 years and 4.5 per thousand for non-Aboriginal children of the same age (ABS 1997a; 1997b).

12.21 NT types of abuse or neglect 1997–98

	NT		Total
	Aboriginal	Non-Aboriginal	
Physical	59	84	143
Neglect	82	25	107
Emotional	3	12	15
Sexual	20	29	49
Total	164	150	314

Note: Numbers of children found to have been abused or neglected (substantiated cases)

Source: Family and Children's Services, THS

Of the 314 NT children who were found to have been abused or neglected in 1997–98, most had been physically abused or neglected: physical abuse and neglect together accounted for 80% (250 children) of substantiated abuse of Territory children (table 12.21). In 1997–98, the most common forms of child abuse in the NT were:

- for Aboriginal children, neglect and physical abuse
- for non-Aboriginal children, physical abuse and sexual abuse

12.22 NT age of abused or neglected children 1997–98

Age Group	NT		NT Total
	Aboriginal	Non-Aboriginal	
<1 year	26	0	26
1–4 years	53	36	89
5–9 years	46	53	99
10–14 years	33	46	79
15–17 years	6	15	21
Total	164	150	314

Note: Numbers of children found to have been abused or neglected (substantiated cases)

Source: Family and Children's Services, THS

In 1997–98, there were differences in the patterns of abuse in young NT children: whereas Aboriginal children were most at risk under five years, non-Aboriginal children were most at risk between the ages of five and fifteen (table 12.22). In 1997–98, nearly half of the abused or neglected NT Aboriginal children were aged under five years, and 26 or 16% were under one year, but only a quarter of the NT non-Aboriginal children were aged under five years and none were under one year.

In general, in 1997–98, the numbers of NT children found to have been abused or neglected decreased slightly with age.

12.23 NT child abusers 1997–98

Relationship to Child	Type				Total
	Physical	Neglect	Emotional	Sexual	
Natural parent	106	113	12	12	243
Step-parent	28	2	1	5	36
Parent's defacto	2	0	1	1	4
Foster parent	0	0	0	0	0
Guardian	2	1	0	0	3
Brother or sister	2	0	0	8	10
Other relative	2	4	0	4	10
Friend/ neighbour	0	0	0	0	0
Other	0	0	0	11	11
Not stated	10	2	3	11	26
Total	152	122	17	52	343

Note: Numbers of children found to have been abused or neglected (substantiated cases)

Source: Family and Children's Services, THS

NT 1997–98 data revealed that a child's natural parent or a person in a parental role (such as their step-parent, guardian or parent's defacto) was most likely to be responsible for abuse or neglect (in 83% or 286 cases) (table 12.23).

Despite the fact that an abused child's natural parent was the person most likely to be responsible for all four types of child abuse and neglect, they accounted for only 23% (12 cases) of sexual abuse in the NT in 1997–98. After natural parents, step-parents were most likely to be responsible for physical abuse (18% or 28 cases).

Children in out-of-home care

Sometimes children are unable to live with their own families and are placed in the guardianship and/or custody of their State or Territory welfare authority. This is always a last option after THS Family and Children's Services welfare staff have attempted all other avenues of support—such as counselling or respite care—that will enable a child to have their needs for care met while they live with their immediate family.

Guardianship, which includes custody, means taking responsibility for the long-term welfare of a child. This includes decisions about a child's health, education and living arrangements. Custody means taking responsibility for the day-to-day care of a child.

Under the NT *Community Welfare Act*, the Family Matters Court may find that a child is in need of care if:

- the child has been abandoned
- the child's parents, guardians or custodians are unable or unwilling to care for them
- the child has been maltreated
- the child is behaving in a way that endangers their health or safety
- the child persistently engages in behaviour that is harmful or potentially harmful to the community

In such circumstances, the court will make an order to secure the child's care and support. This may include:

- directing the parents to do certain things to ensure their child's welfare—for example, making sure their child attends the health clinic or school, or the parents themselves agreeing to undergo counselling
- appointing a guardian and/or custodian

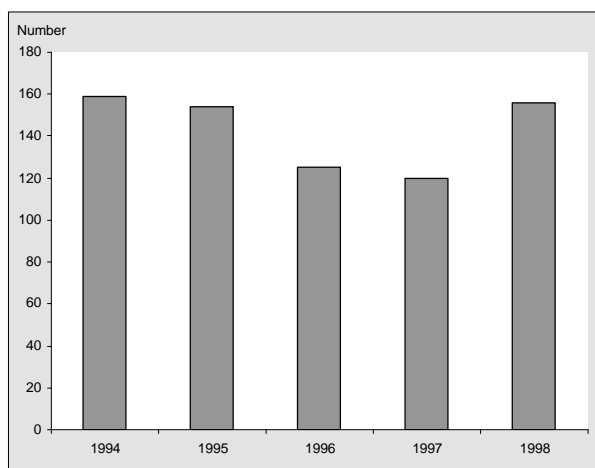
Guardianship and/or custody may be held solely by the Minister for Health, Family and Children's Services or jointly with the child's parents or some other person.

The legislation also enables a child's parents or guardians to request the Minister for Health, Family and Children's Services to assume temporary custody of their child for a short period, usually during a family crisis or when parents need respite.

When a child is placed in the custody of the Minister by either the court or their parents, THS Family and Children's Services welfare staff arrange for the child to be placed in out-of-home care. The NT legislation classifies these children as being 'in care'. In the NT, children in out-of-home care include those who are living with relatives outside of their immediate family; it may also include a small number of children who have returned to live with their parents in anticipation of the expiry or revocation of their guardianship order.

Some children enter care following investigations that find they have been abused or neglected. NT research found that, of children who were abused or neglected in 1991–92, only about 12% entered care (Kerr 1993).

12.24 NT children in out-of-home care



Note: Children in out-of-home care in the NT at 30 June each year

Source: Adapted from THS 1998a (table 1)

In the NT, the number of children in out-of-home care at any one time remained relatively stable between 1994 and 1998 (graph 12.24).

12.25 Age of NT children in out-of-home care 1997–98

	NT Aboriginal	NT Non-Aboriginal	NT Total
0–4 years	69	28	97
5–9 years	30	29	59
10–14 years	34	38	72
15–17 years	7	6	13
Total	140	101	241

Note: NT children placed in out-of-home care

Data: Family & Children's Services Branch, THS

During 1997–98, 241 children were admitted to care in the NT either at their parents' request or by order of the court: 40% were aged under five years; and more than half of all children who entered care were Aboriginal (table 12.25).

Time in out-of-home care

The length of time a child stays in out-of-home care depends on the circumstances of the child and their family. Some children require care for only a day or two while their family situation stabilises or while care is arranged with other family members. Others may need to remain in care for months while family support staff work to reunite the child with their family. A small proportion of children, who are unable to be successfully reunited with their families, remain in care until they are old enough to live independently (usually when they are 17 or 18 years old).

12.26 NT time in out-of-home care 1997–98

Time in care	NT Aboriginal	NT Non- Aboriginal	NT Total
Less than 1 month	65	47	112
1–5 months	10	20	30
6–11 months	2	2	4
12–23 months	3	1	4
More than 24 months	3	6	9
Total	83	76	159

Note: Length of time for children discharged from out-of-home care

Data: Family & Children's Services Branch, THS

Of NT children discharged from out-of-home care in 1997–98, 70% had been in care for less than one month and only 5% of children were in care for more than two years (table 12.26). For Aboriginal children, 78% remained in care for less than one month.

Out-of-home care options

When placing a child in out-of-home care in the NT, THS Family & Children's Services welfare staff are required to explore all possibilities that would enable the child to live with members of either their immediate or extended family (THS 1999a). When this is not possible, most children are placed with volunteer foster carers.

THS assesses and registers, each year, individuals and families who volunteer as foster carers. They receive an allowance to assist with day-to-day costs of the children for whom they care. In 1998, there were 120 registered carers in the NT (THS 1998b).

12.27 NT living arrangements of children in out-of-home care 1998

	NT Aboriginal	NT Non- Aboriginal	NT Total
Living independently	1	2	3
Facility-based care	11	18	29
Home-based care	58	46	104
Other	1	0	1
Total	71	66	137

Notes: At 30 June 1998

'Facility-based care' includes residential care and family group homes

'Home-based care' includes foster carers and relatives

Data: Family & Children's Services Branch, THS

At 30 June 1998, three-quarters of NT children in out-of-home care were in home-based care, most with foster carers or members of their extended family (table 12.27). A small proportion of NT children in home-based care were living with their parents—

mainly children in shared guardianship and/or custody arrangements who were about to return to their immediate family full-time.

Children who are unable to be placed in home-based care, for whatever reason, are usually cared for in one of four family group homes run by THS or non-government agencies. These homes accommodate up to six children or young people in the community. Facility-based care includes residential care for children with disabilities—for example, St Mary's Family Services in Alice Springs and Somerville Community Services in Darwin.

Aboriginal children

The placement of Aboriginal children in care in the NT is guided by the 'Aboriginal child placement principle' in the *Community Welfare Act*. This principle requires that, before an Aboriginal child is placed in out-of-home care, THS Family & Children's Services staff must consult with the child's family and community. This may include Aboriginal child care agencies such as Karu, in the Top End, and the Central Australian Aboriginal Child Care Agency. THS began monitoring compliance with this principle in 1998 through its new Community Care Information System.

Young children

Children under 12 years are best placed in family-based care rather than in group homes because they need the consistent presence of a caring adult with whom they can develop strong bonds. At the end of 1997–98, 81% of children under age 12 in out-of-home care in the NT were in family-based care (Steering Committee for the Review of Commonwealth/State Service Provision 1999).

Adoption

The adoption of a child involves the permanent transfer of legal parental status from one set of parents to another. Adoption is irreversible and severs all previous legal parental relationships. In the NT, the adoption of children is governed by the *Adoption of Children Act*. This legislation defines the responsibilities and obligations of the Minister for Health, Family and Children's Services in relation to (NTH&CS 1994a):

- services for people who wish to relinquish children for adoption
- assessing people who wish to adopt children

- placing children for adoption
- providing information to birth parents, adopting parents and adopted children

12.28 NT adoptions of Australian-born children

Financial Year	Number of Children
1987–88	8
1988–89	6
1989–90	6
1990–91	7
1991–92	5
1992–93	3
1993–94	1
1994–95	2
1995–96	0
1996–97	0
1997–98	1

Note: Australian-born children adopted by people who are not related to them

Source: AIHW 1999

A small and decreasing number of Australian-born children were relinquished for adoption in the NT in the eleven years to 1997–98 (table 12.28).

Australia-wide, there has been a substantial fall in the number of adoptions since the early 1970s. The Australian Institute of Health and Welfare (AIHW 1999) cites a number of contributing factors:

- effective birth control, leading to fewer unplanned pregnancies
- income support for single parents and changing community attitudes to single parenthood, resulting in other alternatives to adoption
- access to alternative reproductive technology such as in-vitro fertilisation (IVF)
- legislative changes relating to adoption by relatives, particularly step-parents
- the introduction of alternative legal orders by which a person other than the child's parent can obtain permanent guardianship and custody of a child

Intercountry adoptions

The United Nations Convention on the Rights of the Child recognises, among other things, that intercountry adoption is an alternative means of caring for a child who cannot be placed in a foster or adoptive family or cannot be cared for in any suitable manner in their country of origin (AIHW 1999). The NT *Adoption of Children Act* establishes the legislative framework for NT families to adopt children born overseas.

12.29 NT adoptions of overseas-born children

Country	1994–95	1995–96	1996–97	1997–98
Korea	2	2	0	2
India	0	4	0	1
Ethiopia	0	0	0	1
Fiji	0	0	1	1
Thailand	0	0	1	1
Other	0	2	0	0
Total	2	8	2	6

Source: THS 1998b:114

Since 1994–95, the majority of overseas-born children adopted in the NT have come from Korea and India (table 12.29). This trend is reflected in national data (AIHW 1999).

Access to adoption information

There were significant changes to adoption legislation, particularly regarding access to information, across Australia in the 1990s. Since 1994, NT legislative changes have allowed birth parents and adopted persons to seek information about one another. They have also enabled people who have an interest in an adoption (generally birth parents and adopted persons) to exchange contact details.

Attempting to balance the right to information and the right to privacy, the NT *Adoption of Children Act* enables either the adopted person or their birth parent to decline to provide (veto) information that would identify them. Alternatively, they may agree to provide information—such as health and family history—but decline to provide contact details. A veto is valid for three years and may be renewed.

12.30 NT applications for adoption information

Applications	Vetoes lodged	
	Information	Contact
1994–95	84	6
1995–96	49	2
1996–97	47	2
1997–98	30	9

Note: Includes renewed vetoes

Source: Adapted from THS 1998b:115

Applications for information were highest in the year following the legislative change and slowly declined in the following three years (table 12.30). Generally, the number vetoes is a small proportion of overall applications.

References

- ABS 1986–1995, *Deaths, Australia*, cat no 3302.0, ABS, Canberra.
- ABS 1990–1996, *Causes of Death in Australia*, cat no 3303.0, ABS, Canberra.
- ABS 1997a, *Experimental Projections of the Aboriginal and Torres Strait Islander Population*, cat no 3231.0, Darwin.
- ABS 1997b, *Population by Age and Sex, Northern Territory, 1997*, cat no 3235.7, Canberra.
- ABS 1998a, *Census of Population and Housing: Aboriginal and Torres Strait Islander People*, cat no 2034.7, ABS, Canberra.
- ABS 1998b, *Census of Population and Housing: Selected Family and Labour Force Characteristics*, cat no 2017.0, ABS, Canberra.
- ABS 1998c, *Experimental Estimates of the Aboriginal and Torres Strait Islander Population*, cat no 3230.0, ABS, Canberra.
- AIHW 1999, *Adoptions Australia 1997–98*, AIHW, Canberra.
- Alperstein G, Thomson J & Crawford J 1996, *Health Gain for Children and Youth of Central Sydney*, Central Sydney Area Health Service, Sydney.
- Andersson B-E 1989, 'Effects of Public Day Care: A Longitudinal Study' *Child Development*, vol 60, no 4, pp 857-66.
- Armstrong K 1999, 'The first three years', *Jigsaw*, National Family Day Care Council (Aus) Inc, no 12, pp 6–7.
- Barker DJP, Gluckman PD, Godfrey KM and others 1993, 'Fetal nutrition and cardiovascular disease in adult life', *Lancet*, no 341, pp 938–41.
- Cummings E & Katona M 1995, *Aboriginal Family Violence Strategy, Occasional Paper No 12*, Office of Women's Policy, Darwin.
- Deschamps JP 1997, 'Adolescent Health Today: Contributions and limitations of epidemiology, facts, doubts and uncertainties', *Promotion and Education*, vol 1, no 4.
- d'Espaignet ET, Kennedy K, Paterson BA & Measey ML 1998, *From Infancy to Young Adulthood: Health Status in the Northern Territory 1998*, THS, Darwin.
- H&FS 1996, *The Development of a National Planning Framework for Child Care: Discussion Paper*, AGPS, Canberra.
- H&FS c1998, NT Children's Services 1998–1999: Child Care Planning Advisory Committee planning document, H&FS, Canberra.

- Hoghugh M & Speight AN 1998, 'Good enough parenting for all children—a strategy for a healthier society', *Archives of Disease in Childhood*, vol 78, no 4.
- Hoy WE, McFarlane P, Pugsley DJ and others 1996, 'Markers for cardiovascular and renal morbidity: expectations for an intervention programme in an Australian Aboriginal community', *Clinical and Experimental Pharmacology and Physiology*, vol 23, no 8, supplement pp 33–7.
- Jolly D and others 1992, *Health Goals and Targets for Australian Children and Youth: a Project Report*, Child, Adolescent and Family Health Services, Adelaide.
- Kerr P 1993, Aboriginal child protection issues (unpublished discussion paper), Family Youth and Children's Services Program Directorate, NTH&CS, Darwin.
- Keys Y 1994, *Alcohol and Violence against Women and Children in the Home*, AGPS, Canberra.
- Kruske SG, Ruben AR & Brewster DR 1999, 'An iron treatment trial in an Aboriginal community: improving non-adherence', *Journal of Paediatrics and Child Health*, vol 35, no 2, pp 153–8.
- Lister SM & Jorm LR 1998, 'Parental smoking and respiratory illnesses in Australian children aged 0–4 years: ABS 1989–90 National Health Survey results' *Australian and New Zealand Journal of Public Health*, vol 22, no 7, pp 781–6.
- Lozoff B, Jimenez E & Wolf AW 1991, 'Long-term developmental outcome of infants with iron deficiency', *New England Journal of Medicine*, vol 325, no 10, pp 687–94.
- Markey PG, d'Espaignet ET, Condon JR & Woods M 1998, *Trends in the Health of Mothers and Babies, Northern Territory, 1986–95*, THS, Darwin.
- Mathers C 1995, *Health Differentials Among Australian Children*, AIHW, Health Monitoring series no 3, Canberra.
- Ochiltree G 1994, *Effects of Child Care on Young Children—Forty Years of Research*, Early Childhood Study Paper no 5, AIFS, Melbourne.
- Moo S, Searle J & Condon J 1998, *NT Hospital Utilisation in Perspective: the Impact of Population and Disease Trends 1993–1997*, Business Information Management Branch, THS, Darwin.
- National Child Protection Clearing House web site: http://www.aifs.org.au/external/nch/nch_menu.html
- NT Kidsafe web site: <http://www.ozemail.com.au/~kidsafen/S2about.htm>
- NTH&CS 1994a, *Adoption of Children Act 1994: Policy and Procedures Manual*, Darwin.
- NTH&CS 1994b, Child protection policy statement (unpublished), Darwin.
- NTH&CS 1994c, NT hearing health policy (draft report), Community Health Policy Branch, Darwin.
- Packard D & Packard L 1995, *The Future of Children*, vol 5, no 3, Centre for the Future of Children, New York.
- Paterson B, Ruben A & Nossar V 1998, 'School screening in remote Aboriginal communities—results of an evaluation', *Australian and New Zealand Journal of Public Health*, vol 22 no 6, pp 685–9.
- Schweinhart LJ & Weikart DP 1980, *Young Children Grow Up: The effects of the Perry preschool program on youths through age 15*, monograph no 7, High/Scope Press, Ypsilanti, Michigan.
- Scott J 1998, Reorientation of a clinical hearing health service to a public health focus (Public Sector Management Course project), in possession of Central Library, THS, Darwin.
- Secombe P 1998, *Middle Ear Screening Isolation Ward—Royal Darwin Hospital* (poster) NT Hearing Services, THS, Darwin.
- Silva DT, Ruben AR, Wronski I & others 1998, 'Excessive rates of childhood mortality in the Northern Territory, 1985–94', *Journal of Paediatrics and Child Health*, vol 34, no 1, pp 63–8.
- Skull S and others 1999, Middle ear effusion: rate and risk factors in Australian children attending day care, *Epidemiology and Infection*, vol 123, no 1, pp 57–64.
- Steering Committee for the Review of Commonwealth/State Service Provision 1999, *Report on Government Services 1999*, vol 2, Ausinfo, Canberra.
- THS 1997, *Standards: Northern Territory Child Care Centres*, Family & Children's Services Branch, THS, Darwin.
- THS 1998a, Family, youth & children's services program quarterly bulletin: September 1998 quarter (unpublished), Business Information Management Branch, Darwin.
- THS 1998b, *THS Annual Report 1997–98*, NTGP, Darwin.
- THS 1999a, *Family and Children's Services Policy and Practice Manual*, Darwin.
- THS 1999b, *Guidelines for Outside School Hours Care Services in the Northern Territory*, Family & Children's Services Branch, THS, Darwin.

Walter T 1993, 'Impact of iron deficiency on cognition in infancy and childhood', *European Journal of Clinical Nutrition*, no 47, pp 307–16.

Walter T 1989, 'Iron deficiency anemia: adverse effects on infant psychomotor development', *Pediatrics*, vol 84, no 1, pp 7–17.

Wilson AC, Forsyth JS, Greene A and others 1998, 'Relation of infant diet to childhood health: seven year follow up of cohort of children in Dundee infant feeding study', *British Medical Journal*, vol 316, no 7124, pp 21–5.

World Bank 1993, *World Development Report 1993: Investing in Health*, Oxford University Press, Oxford.

Women's health

by Jenne Roberts

The Northern Territory is characterised by cultural diversity and by isolation, and the women who live here reflect the Territory's unique nature. While some groups of women in the Territory are among the healthiest in Australia, major differences are apparent between Aboriginal and non-Aboriginal women, and between women living in towns and women in rural and remote areas.

Patterns of illness and injury differ between women and men. If illness is gender specific, such as cervical cancer, these differences are obvious; but when both men and women are affected, the differences can be more subtle.

One third of NT women live in rural or remote communities. Isolation is a significant issue for these women as it affects their access to services, particularly in emergencies. Women on pastoral properties or in remote communities may be expected to provide both basic and emergency care for their family and workers.

Access to specialist services is limited in many parts of the Territory. When choosing treatment options, women must take into account a range of factors, including the distance to the treatment or to a specialist, alternative care arrangements for children and other family members and the location of supportive friends and family (WHSU 1999). There is likely to be little or no choice of provider or location of service.

Socioeconomic status influences the physical environment in which people live and work. It often impacts on access to health care and the capacity of individuals to change behaviour patterns which are known (but not necessarily by them) to be hazardous to health. The combination of low socioeconomic status, remoteness and a first language other than English indicates a risk of compromised health status and low life expectancy. This, combined with limited access to culturally appropriate and accessible services for women living in remote areas, is reflected in the relatively poor health status of Aboriginal women in the Northern Territory.

NT women—a snapshot

In June 1998, the estimated resident population of the Northern Territory was 189,937. Of this, 47% (89,680) were women. Women in most other States and Territories comprise 50% of the population. In 1996, approximately 27% of Territory women identified as Aboriginal (ABS 1997d). A further 20% were born overseas (ABS 1996a).

The average age of women in the Territory is 27, which is seven years younger than the Australian average. Women aged over 65 form only 3% of the female population compared with 14% nationally (ABS 1998).

13.1 NT women by age and indigenous status 1996

Age Group	Aboriginal		Non-Aboriginal		NT women	
	No.	%	No.	%	No.	%
Under 20	12,236	46.3	18,410	29.8	30,646	34.7
20–29	5,302	20.0	12,560	20.3	17,862	20.2
30–49	6,201	23.4	22,450	36.3	28,651	32.4
50–69	2,238	8.5	7,116	11.5	9,354	10.6
70 and over	470	1.8	1,333	2.1	1,803	2.1
Total	26,447	100.0	61,869	100.0	88,316	100.0

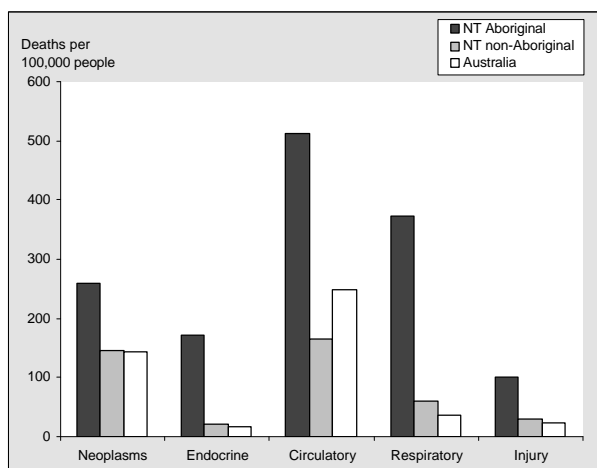
Data: Epidemiology Branch, Territory Health Services, based on Australian Bureau of Statistics data, 1996

Aboriginal women in the NT are comparatively young, with almost half (46%) aged under 20 (table 13.1). By comparison, only one third of NT non-Aboriginal women are under 20 (ABS 1998).

Life expectancy

Death statistics indicate that, in general, non-Aboriginal NT women have a similar or slightly better health status than Australian women. In 1995, the life expectancy of non-Aboriginal NT women was 83 years, three years longer than Australian women overall.

13.2 Female death rates: main causes of death 1991 to 1995



Notes: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population
'Endocrine' includes diabetes

Data: Epidemiology Branch, Territory Health Services

The statistics for Aboriginal women, however, indicate severe health problems (graph 13.2). In 1995, the life expectancy of Aboriginal women in the Territory was 62 years—more than 20 years less than the life expectancy of Australian women overall (ABS 1997a). Age standardised death rates for Aboriginal women in the Northern Territory indicate that the death rate in 1996 was three times that of non-Aboriginal women (AIHW 1998). Further information on death rates and causes of death can be found in the Causes of death chapter.

Incidence of illness

Compared to Australian women overall, non-Aboriginal NT women have:

- fewer hospital admissions
- lower rates of death
- longer life expectancy
- similar rates of new cases of cervical cancer
- breast cancer as the commonest cause of cancer death
- very low maternal mortality
- very low child mortality (WHSU 1999)

While some gains have been made in Aboriginal health, especially in maternal and child health, there are still considerable disparities between Aboriginal and non-Aboriginal health.

NT Aboriginal women experience:

- higher death rates than the general population
- shorter life expectancy (21 years less than other NT women)
- triple the rate of new cases of cervical cancer, with nearly all resulting in death
- death rate by cancer 12 times as high as non-Aboriginal women
- lung cancer as the commonest cause of cancer death
- three times greater risk of infant mortality (although the rate has halved in the ten year period since 1986) (WHSU 1999)

The leading causes of hospitalisation for non-Aboriginal NT women for the period 1979 to 1991 were birthing, genitourinary conditions and injury. Hospitalisation of Aboriginal NT women during this period was related to birthing, genitourinary and respiratory conditions and injuries (Markey G 1998).

Injury and violence against women

Injury results in enormous costs to the health care system in treatment and rehabilitation. When disability ensues, it also creates ongoing personal and financial burdens. In the years 1989 to 1991, injuries (including poisoning) appeared in the top four causes of death for Territory women.

Injury is the principal cause of death in younger women (aged 15 to 34) and, excluding pregnancy, is responsible for the highest number of hospital admissions in this age group for both Aboriginal and non-Aboriginal women (Plant & others 1995). Road transport accidents are a major contributing factor. In 1997, half of all recorded road injuries in the NT were sustained by women aged between 15 and 34 (Road Safety Council of the NT 1998).

However, it is violence, particularly domestic and family violence, which is the single greatest cause of hospital admissions for injury among Aboriginal women in the Territory. In 1997, half of all injury admissions were women, 95% of whom were Aboriginal. In 1997, over 900 Aboriginal women were admitted to Territory hospitals as a result of intentional injuries inflicted by another person. In the five years to 1997, 47% of all patients admitted to hospital for intentional injuries inflicted by another person were Aboriginal women, two-thirds of whom were aged between 25 and 49 (Markey G 1998).

Domestic violence

In 1996–97, in the greater Darwin area alone, police were called to an average of six domestic violence incidents every night. In 47% of these cases, children were present in the household. Physical violence, threats and psychological abuse were reported in about 75% of the cases and sexual abuse occurred in about 60% (Thompson & Hunter 1997). In 1996–97, 35% of reported domestic violence incidents concerned women of overseas origins.

In the month of January 2000, police responded to 434 domestic violence incidents in the Northern Territory. Of the 133 incidents in the Alice Springs urban area, weapons were involved in 20% of cases. Of the 200 incidents attended in the Darwin/Palmerston area, 13% involved weapons (Police Domestic Violence Unit 2000).

In 1997–98, 749 women in the Northern Territory utilised supported accommodation in order to escape domestic or family violence. Of these, 80% were Indigenous (AIHW Catalogue No. HOU32).

In 1998, Royal Darwin Hospital emergency department conducted a snapshot survey of domestic and family violence presentations for the three months of October, November and December. During this period, of a total 10,125 presentations, 64 people presented for treatment of injuries sustained in domestic or family violence incidents. Of the 64 patients, 75% were female and 65% were Aboriginal. Alcohol was involved in 56% of the incidents and there was a previous history of domestic violence in 70% of cases (Mansfield 1999).

The estimated direct annual cost of domestic violence in the NT in 1996 was \$8.86 million. This includes money spent on medical care, accommodation, repairs to houses and property, policing, counselling services and community awareness campaigns. This represents a direct annual cost of at least \$5,377 per victim (a yearly cost of \$50 for every individual in the NT). Approximately one-third of this is related to the cost of emergency accommodation and support services and about 18% is spent on public housing. The community, including the government, carries approximately 80% of the direct costs, while the individual carries 95% of the indirect costs. As women are the victims of domestic violence in 98% of cases, these financial costs impact greatly on the family and extended family (KPMG Management Consulting 1996).

In 1994, The Northern Territory Government Domestic Violence Strategy was established. This

comprises an across-government coordinated response to domestic and family violence. The Strategy aims to assist women who are subjected to physical and sexual violence and to minimise the level of violence against women. Developments include:

- the establishment of support services such as rape crisis centres, women's shelters, temporary housing and counselling support services
- the formation of specialist police and medical service units with expertise in investigating complaints, collecting evidence and treating female victims of violence
- reforming the laws, thus enabling women to obtain protection from domestic violence through police and the courts
- initiating community awareness programs aimed at reducing the level of violence against women

Aboriginal family violence

Aboriginal women from urban and remote areas prefer the term "family violence". Family violence encompasses domestic violence, child abuse and sexual assault. This term is used because violence in families affects parents, children, community members and extended family (Cummings & Katona 1995, Apunipima Family Violence Advocacy Project 1999). In a 1994 national survey of Aboriginal and Torres Strait Islander people, approximately 48% of people aged 13 years and over said that they thought family violence was a common problem in their local area (ABS 1994).

Violence against women and children has never been an accepted part of the shared Aboriginal lifestyle (Hayden & King 1996). "When traditional women are asked about rape and the incidence of incestuous sexual assaults, their responses are emphatic that it is not Aboriginal way, that it is not in accordance with Aboriginal traditions or customary law" (Lloyd & Rogers 1992).

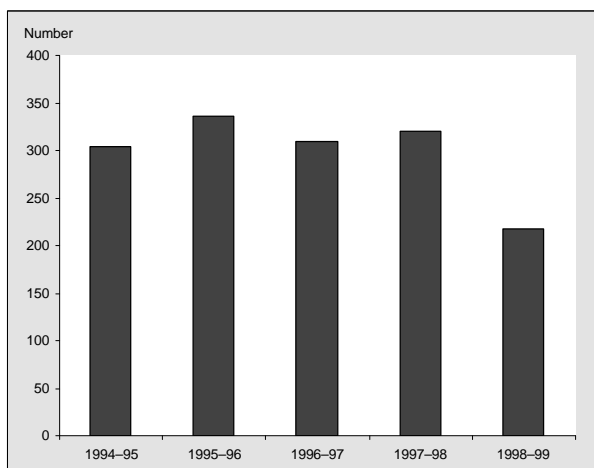
Aboriginal women, because of cultural and traditional laws, have found it very difficult to break away from their families when affected by domestic violence. Aboriginal women are part of a kin group in which the family is an important unit. These women do not wish to leave their community, as this would usually mean moving away from their land and language. They usually prefer to address the issue of violence within the family structures (Cummings & Katona 1995). Under Aboriginal law, a woman may not leave her violent husband unless she has permission from his family.

In 1995, the NT Government established the Aboriginal Family Violence Strategy to provide assistance to Aboriginal people in managing family violence in a community-based and culturally appropriate way. Aboriginal women have established community night patrols, women's grog councils, community safe houses, shelters in women's business grounds and programs which send family violence offenders to outstations.

Sexual assault

The Northern Territory annually records the highest level of violence in Australia (O'Kane 1994). In 1994, the national reporting rate for sexual assault was 74 per 100,000 people. In the same year in the NT, the National Crime Statistics reported 115 cases per 100,000 people (Hunter 1996).

13.3 Reported sexual assaults in the NT 1994 to 1999



Source: Northern Territory Police, Fire and Emergency Services Annual Report, 1998-99

The true extent of sexual assault in the community is not known, as the majority of victims do not disclose the experience (NSW Sexual Assault Committee 1984). In addition, inconsistencies in definitions and methods of data collection across jurisdictions make the compilation and comparison of data difficult (graph 13.3). A 1993 Australian Bureau of Statistics National Victim Survey of 52,000 Australians found that three-quarters of sexual assaults were not reported to police (cited in O'Kane 1994).

A 1994 report into sexual assault services in Alice Springs estimated that approximately 360 women were sexually assaulted in the Alice Springs urban area in 1993-94 and up to 650 children and adolescents experienced sexual abuse. The report, by the Alice Springs Sexual Violence Action Group,

regards this as a conservative estimate, as it does not accommodate the local service providers' experience that Aboriginal women report sexual assault less frequently than non-Aboriginal women (O'Kane 1994).

In Darwin in 1998-99, a total of 202 clients approached the Sexual Assault Referral Service for support services. Of these, 42 clients (three or four per month) were adult survivors of recent rape, and 25 were child survivors. Of the 42 clients using the service who had recently been raped, 38 were female, of whom 17 adults and 12 children were Aboriginal, and four were adult males (THS Annual Report 1997-98).

Each month, an additional three or four recent rape survivors received support from Ruby Gaea, a non-Government sexual assault service in Darwin (Ruby Gaea Annual Report 1998). In 1998, 87% of the sexual assault survivors who used Ruby Gaea House reported having been sexually assaulted by a person known to them; strangers constituted only 13 of 114 offenders. That year, 71% of Ruby Gaea's clients, who are all female, identified as Anglo-Australians and 17% identified as Aboriginal or Torres Strait Islander (Ruby Gaea 1999).

In 1999, the sexual assault counsellor in Katherine provided counselling and support to 27 sexual assault survivors. Of these, 18 victims were adult females and six were female children. The remaining three clients were male (Katherine Family Link 2000).

In the NT between 1988 and 1990, the majority of victims of reported cases of sexual assault were children under the age of 16. The majority of victims were female, and the majority of offenders were known and/or related to the child (Manzie 1992). Perpetrators of child sexual abuse are most likely to be male members of the child's family. (For further information, see the Children's health and welfare chapter.) Similarly, 80% of adult sexual assault survivors know the offender. In the NT, 67% of all reported sexual assaults occur in the survivor's home (Hunter 1996).

The Sexual Assault Services Strategy for Territory Health Services identified the need for minimum standards of service delivery and the development of services responsive to the needs of Aboriginal victims of sexual assault (THS 1995). In 1997, minimum standards for sexual assault service providers were introduced, and an Aboriginal counsellor was employed by the Darwin Sexual Assault Referral Service.

Nutrition and exercise

Poor nutrition has been linked to the development of preventable chronic diseases, including adult onset diabetes, heart attack and related disease (ischaemic heart disease), respiratory disease (chronic obstructive airways disease), high blood pressure (hypertension) and kidney disease (Godfrey 1988). Additionally, women are at risk of specific diet-related conditions such as iron deficiency related to menstruation and pregnancy. Data from the Risk Factor Prevalence Surveys and the National Health Survey indicate that the proportion of overweight or obese Australian women aged between 25 and 64 years increased from 27% in 1980 to 46% in 1995 (AIHW 1998). Based on their Body Mass Index (BMI), Indigenous people are more likely than other Australians to be classified as obese. In 1994, about 28% of Aboriginal women surveyed were classified as obese (BMI greater than 30) compared to 19% of adult women in the general population (AIHW 1998).

Eating healthy foods depends not only on choice, but also on availability, affordability, and factors related to storage and preparation. Limited availability of fresh foods is often a problem in remote areas. "Worry about going without food" has been reported as a major concern for many Aboriginal women (ABS 1996b). For more information on the nutrition of people in the NT, see the Food and nutrition chapter.

Smoking

Between 1987 and 1993, lung cancer was the commonest cancer and commonest cause of cancer death among Territorian women. Between 1991 and 1995, diseases of the respiratory system, including pneumonia, emphysema, asthma and pulmonary embolism, were the second leading cause of death for Aboriginal women and the third leading cause of death for non-Aboriginal women. All these respiratory diseases have a known association with smoking.

Aboriginal women experience ten times more deaths from respiratory disease than the national average (THS 1998). The respiratory disease death rate for NT non-Aboriginal females is also much greater than for other Australian women (THS 1998).

Smoking is more common among NT women than among their national counterparts. In 1994, 34% of NT women aged 18 to 24 were smokers compared with 23% nationally (Richards & McComb 1996).

A study of secondary school students in the NT suggested that 13% of 15- to 17-year-old girls smoked every day (Bertram & O'Reilly 1998). Seven out of ten Aboriginal women in the Top End over the age of 15 years smoke (Watson & others 1988). Aboriginal women are five times more likely than non-Aboriginal women to go to hospital as a result of smoking related illnesses (Measey & others 1998).

Alcohol and other drug use

Alcohol and other drug use is prevalent amongst NT women, with levels of use among young women and Aboriginal women being particularly high. A survey of NT secondary school students suggests that the use of alcohol and other drugs is common among teenage girls. Experimental use of marijuana, tranquillisers, LSD, speed and heroin was reported by older girls, and glue, paint and petrol sniffing by 12- to 14-year-old girls (Bertram & O'Reilly 1998).

It also appears that women in the NT are following a world-wide trend of increasing use by women of alcohol and other drugs. A 1994 study of 16- to 24-year-olds noted that alcohol and other substance use was much lower in women than men. A similar study four years later revealed that consumption by young men has remained relatively stable, but alcohol use by young women has increased (O'Reilly & Townsend 1999).

The social reasons for substance use appear to have notable gender differences. While young males' substance use is often related to peer pressure, substance use by young females is often considered to be an expression of independence or of sexual equality. This highlights the importance of developing gender specific strategies to educate young people about alcohol and other substance use (O'Reilly & Townsend 1999).

The differences in metabolic rates between males and females means women are at an increased risk of adverse health effects from alcohol and other drug use. Females develop alcohol dependency at lower levels of use and in a shorter time than males. They are more sensitive to alcohol and drugs such as cannabis, and the effects of sedatives, such as benzodiazepines, are prolonged. Lack of awareness of their lower tolerance may result in young women adopting male consumption patterns and suffering increased adverse effects of drug use (O'Reilly & Townsend 1999).

The 1992 NHMRC guidelines for responsible drinking suggest that women should drink no more than two standard drinks per day, and have two alcohol free days per week. In March 1997, the NT Government's Living With Alcohol program conducted a household survey of alcohol consumption. It revealed that only one-third of women drank responsibly (less than two standard drinks per day). Another one-third drank at hazardous levels (two to four drinks per day) and the remaining one-third at harmful levels (more than four drinks per day). In general, Territorians do have two alcohol-free days per week (Bertram & Crundall 1997).

In a 1994 survey of self-assessed health problems, 58% of Aboriginal Australians identified alcohol as one of the main health problems faced by Aboriginal people. In the same survey, 30% of Aboriginal men and 60% of Aboriginal women in the NT reported never having drunk alcohol (ABS 1995). For further information on alcohol and other substance use in the NT, see the Substance misuse chapter.

Reproduction and sexual health

Maternal health and childbirth

Women of childbearing age comprise 53% of the female population of the NT (ABS 1998). Approximately 3,500 babies are born in the Territory each year. The majority of these deliveries occur in hospital. In 1995, only 4.5% of Aboriginal babies and 2% of non-Aboriginal babies (total 97 babies) were born out of hospital (d'Espaignet & others 1998).

Of the women who gave birth in 1995, 34.5% (1,244) were Aboriginal and 65.5% were non-Aboriginal. There are significant differences in maternal health between Aboriginal and non-Aboriginal women in the Territory. The Aboriginal mothers were more likely to be young (29.3% aged under 20), anaemic (18.7%), and to have had no antenatal care before presenting for delivery (2.8%). Far fewer non-Aboriginal mothers were aged under 20 (6%). Non-Aboriginal mothers had low rates of anaemia (3%) and all but 0.3% received antenatal care. The total fertility rate (average number of children per woman) was 2.6 for Aboriginal women and 2.0 for non-Aboriginal women (d'Espaignet & others 1997).

13.4 Complications of pregnancy 1995

	Aboriginal %	Non-Aboriginal %
Medical complications	45.7	16.8
Obstetric complications	24.9	19.7
Delivery complications	44.8	39.5
Puerperal complications prior to discharge	16.4	4.2

Source: Kildea S 1999

Complications of pregnancy are more common in Aboriginal than non-Aboriginal women. In particular, medical complications of pregnancy, such as high blood pressure and diabetes, are much more common in Aboriginal women (table 13.4). Although the total figures are very small, maternal mortality is nearly 30 times higher in Aboriginal women. Between 1979 and 1991 there were 88 maternal deaths for every 100,000 Aboriginal births and 3 maternal deaths for every 100,000 non-Aboriginal births.

13.5 Perinatal and infant mortality rates 1995

	Aboriginal	Non-Aboriginal
Neonatal mortality rate	9.8	5.0
Perinatal mortality rate	26.4	11.6
Infant mortality rate	18.7	7.1

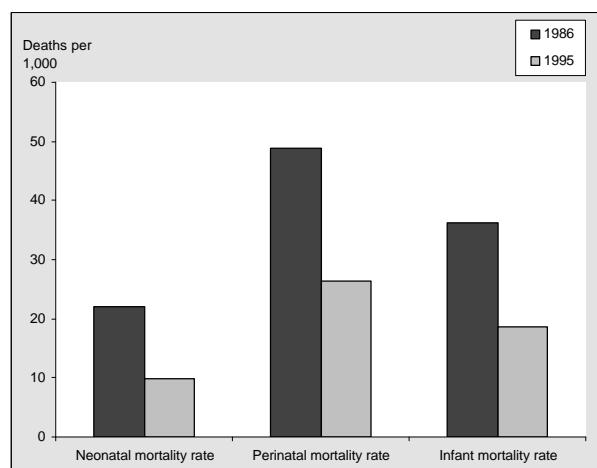
Notes: 'Neonatal mortality rate' is death of liveborn infants within 28 days of birth per 1,000 live births
'Perinatal mortality rate' is stillbirths and neonatal deaths per 1,000 total births
'Infant mortality rate' is all deaths in the first year of life per 1,000 live births

Source: d'Espaignet, Woods & Measey 1997

Aboriginal women are more likely to have stillbirths, with 16.8 stillbirths in every 1,000 births compared with 6.7 for non-Aboriginal women. Aboriginal babies have more than double the rate of infant and perinatal mortality of non-Aboriginal newborns (table 13.5). This is partly attributable to high levels of maternal infection and poor maternal nutrition. Both maternal malnutrition and anaemia are known to be associated with low infant birth weight (<2500g) (Godfrey 1998). A recent study using data from Royal Darwin Hospital attributed 28% of low birth weight and 15% of intrauterine growth retardation to maternal malnutrition (Sayers & Powers 1997).

Low birthweight babies are at risk not only of poor health later in childhood, but also of chronic diseases, such as diabetes and kidney failure, in adulthood (Weeramanthri 1998; Hoy and others 1996). While 12.9% of Aboriginal babies are low birthweight, only 5.6% of non-Aboriginal babies are in this category.

13.6 NT Aboriginal perinatal and infant mortality 1986 to 1995



Notes: 'Neonatal mortality rate' is death of live born infants within 28 days of birth per 1,000 live births
 'Perinatal mortality rate' is stillbirths and neonatal deaths per 1,000 total births
 'Infant mortality rate' is all deaths in the first year of life per 1,000 live births

Source: Markey, d'Espaignet, Condon & Woods 1998

There have been some significant improvements in Aboriginal maternal health over the past decade. The number of low birthweight babies has decreased from 15% in 1986 to 12.9% in 1995, and stillbirths have decreased from 27.5 per 1,000 births to 16.8 per 1,000 births. Aboriginal infant mortality has improved over the years 1986 to 1995 (graph 13.6). Further improvements are required in order to bring health levels for Aboriginal mothers and babies in line with their non-Aboriginal counterparts.

Postnatal depression

Having a baby is a time of significant change for women. In particular, the arrival of the first child affects women's lives in ways that may be unexpected. There is a range of common responses to this time of change (Rathman 1998).

Some responses, if they persist, may indicate postnatal depression (PND). These include agitation and tearfulness, despondency, feelings of inadequacy and inability to cope, feelings of guilt and shame, gaining no pleasure from the new baby and disturbance of sleeping and eating. Although the occurrence of these symptoms does not necessarily constitute a clinical depression, the presence of a number of persistent symptoms, causing significant impairment, may indicate PND (Rathman 1998).

PND often goes undiagnosed due to the gradual onset of the illness, the variety of initial symptoms, lack of contact with professionals assessing maternal health,

or the failure of either the woman or the health professional to recognise postnatal depression (Dalton & Holton 1996). PND causes considerable distress to the new mother, interferes with her attachment to her baby and with the baby's development, and may affect marital, family and social relationships.

Short-term projects have been run in Alice Springs and Darwin providing training to midwives and community health service providers in the diagnosis and management of women with PND. These projects have also provided a limited amount of direct support to women with PND.

Sexually transmitted diseases

A comprehensive remote area Well Women's Screening Program was introduced into the Northern Territory in 1994-95. Well Women's checks are performed by Aboriginal Health Workers, nurses and female doctors at two-yearly intervals, and a Territory-wide Pap smear reminder system is in place. As well as screening for cervical cancer, the Well Women's checks include screening for sexually transmitted diseases and chronic diseases such as high blood pressure, diabetes and kidney disease.

Screening for sexually transmitted diseases and cervical cancer is a particularly sensitive procedure for some Aboriginal women, as it conflicts with cultural beliefs. The genitals are regarded as private and sacred, and traditionally were not looked at or touched by anyone. However, Aboriginal women are concerned about infertility, sexually transmitted diseases and cervical cancer. Education, provided by qualified women's health practitioners and Aboriginal Health Workers, and the implementation of culturally acceptable screening methods contribute to making screening more acceptable to Aboriginal women (Congress Alukura & Nganampa Health Council Inc 1999).

In 1997, chlamydia was the most frequently notified sexually transmitted disease (STD) in NT women. Chlamydia is often asymptomatic although the disease may have the long-term consequences of pelvic inflammatory disease and infertility. In the NT, chlamydial infection is recorded three times more often in women than in men, although this may be because men are less likely to present for treatment (NTH&CS 1995). Notification rates for gonorrhoea (up 24% in 1997) and chlamydia (up 7% in 1997) have increased significantly (THS 1998). This increase in detection is probably due to the success of sexual health screening programs.

In the mid-1990s, the Well Women's Screening program, operational in Top End Aboriginal communities, found that up to 30% of Aboriginal women were infected with trichomoniasis (Duquemin 1996). Recent studies have identified links between trichomoniasis and infertility, premature birth and low birthweight babies (Cotch 1997).

For more detailed information on STDs and an analysis of why the rates of STDs are so different in the NT, see the STD section of the Communicable diseases chapter.

Cervical cancer

From 1987 to 1993, there was one death for every five new cases of cervical cancer among non-Aboriginal NT women. Among Aboriginal women, the ratio was one death for every newly diagnosed case (d'Espaignet & others 1996). Aboriginal women are 12 times more likely to die of cervical cancer than other NT women. This is probably due to the low Pap smear rate among Aboriginal women.

The Cervical Screening Program, introduced in 1994, promotes an organised approach to preventing cancer of the cervix. It distributes information encouraging women to have Pap smears, cares for women with abnormalities detected at screening, and provides a Pap smear reminder service to women and practitioners. The program targets women aged 20 to 69 years, and recommends a Pap smear every two years.

Based on NT Pap Smear Register data and the 1997 estimated residential female population, 64% of NT women in this target age group had a Pap smear in 1997 or 1998 (THS, 1999). The cervical cancer screening participation rates of women living in remote communities has been increasing each year since the program was introduced. In 1997-98, participation rates were between 35% and 64%, depending on the community (THS 1998). For more information on cervical cancer, see the Cancer chapter.

Breast cancer

Breast cancer is the commonest cause of cancer death among women in Australia (NHMRC 1997). In the Northern Territory in the period 1987 to 1993, cancer of the breast was the second commonest type of newly diagnosed cancer. There is one death for every four newly diagnosed cases of breast cancer among non-Aboriginal women in the Territory

(d'Espaignet & others 1996). Very few cases of breast cancer are diagnosed among Aboriginal women. Aboriginal women diagnosed with breast cancer tend to be diagnosed at a late stage of the disease.

A breast screening service was introduced to the Northern Territory in 1994. This service provides free mammography (breast X-ray) screening for the early detection of breast cancer in women aged 50 to 69 years. For more information on breast cancer, see the Cancer chapter.

Women with disabilities

In 1998, 41% of all clients of disability services in the Northern Territory were women. The most commonly reported primary disabilities among these women were:

- Intellectual 45%
- Physical 26%
- Acquired brain injury 10%

Speech disability was the most commonly reported secondary disability.

Multiple disabilities were reported by 72% of all clients of disability services. In 1998, 55% of all NT clients of disability services were Aboriginal and 75% of clients were aged between 15 and 40 years (THS 1998).

Women are often the carers of those with disabilities. In 1998, 38% of clients of disability services lived with their spouse. At an older age, when it may be more difficult for women to take care of themselves, they may also find themselves caring for a parent, husband, child or other relative with a disability.

References

- ABS 1994, *Self-Assessed Health Status, Indigenous Australians 1994*, cat no 4707.0, ABS, Canberra.
- ABS 1995, *National Aboriginal and Torres Strait Islander Survey 1994*, cat no 4190.0, ABS, Canberra.
- ABS 1996a, *1996 Census of Population and Housing, Selected Social and Housing Characteristics for Statistical Local Areas: Northern Territory*, cat no 2015.7, ABS, Canberra.
- ABS 1996b, *National Aboriginal and Torres Strait Islander Survey Northern Territory*, cat no 4190.7, ABS, Canberra.

- ABS 1997a, *Deaths 1995 Australia*, cat no 3302.0, ABS, Canberra.
- ABS 1997b, *Population by Age and Sex, Australian States and Territories, 1996*, cat no 3201.0, ABS, Canberra.
- ABS 1998, *Regional Statistics 1998, Northern Territory*, cat no 1362.7, ABS, Canberra.
- AIHW 1998, *Australia's Health 1998*, cat no AUS10, AIHW, Canberra.
- AIHW 1998, *SAAP National Data Collection, Northern Territory Annual Report 1997-98* Canberra.
- Bertram S & Crundall I 1997, *Summary of Household Survey of Alcohol Consumption and Related Attitudes February–March 1997*, Alcohol and Other Drugs Program, THS, Darwin.
- Bertram S & O'Reilly B 1998, *Summary of the 1996 Australian Secondary School Alcohol and Drug Survey Northern Territory Findings*, Alcohol and Other Drugs Program, THS, Darwin.
- Congress Alukura & Nganampa Health Council, 1999, *Minymaku Kutju Tjukurpa Women's Business Manual*, Alice Springs.
- Copeland J 1995, *A Qualitative Study of Self-managed Change in Substance Dependence Among Women*, technical report no 24, NDARC, Sydney.
- Cotch MF, Pastorek JG, Nugent RP and others 1997, 'Trichomonas vaginalis associated with low birth weight and preterm delivery', The Vaginal Infections and Prematurity Study Group, *Sexually Transmitted Diseases*, vol 24, no 6, pp353–60.
- Cummings E & Katona M 1995, *Aboriginal Family Violence Strategy*, Office of Women's Policy occasional paper no 12, Darwin.
- Daws L, Bramock J, Brooker R and others 1995, *Young People's Perceptions of and Attitudes to Sexual Violence: a Report to the National Youth Affairs Research Scheme*, National Clearinghouse for Youth Studies, Hobart.
- Dalton K & Holton W 1996, *Depression After Childbirth*, Oxford University Press, New York.
- d'Espaignet ET, Kennedy K, Paterson BA & Measey ML 1998, *From Infancy to Young Adulthood: Health Status in the Northern Territory 1998*, THS, Darwin.
- d'Espaignet ET, Measey ML, Condon JR and others 1996, *Cancer in the Northern Territory 1987–1993*, THS, Darwin.
- d'Espaignet ET, Woods M & Measey ML 1997, *Northern Territory Midwives Collection: Mothers and Babies 1995*, THS, Darwin.
- Duquemin A 1996, *Women's Cancer Prevention Program Early Evaluation of the Remote Areas Well Women's Screening Program, June 1996*, THS, Darwin.
- Godfrey K 1998, 'Maternal regulation of fetal development in health in adult life', *European Journal of Obstetrics and Gynaecology and Reproductive Biology*, vol 78, pp141–50.
- Hayden K & King M 1995, *Aboriginal Women, Violence and the Legal System*, Domestic Violence Legal Help, Darwin.
- Hoy W, McFarlane R, Pugsley D and others 1996, 'Markers for cardiovascular and renal morbidity: expectations for an intervention programme in an Australian Aboriginal community', *Clinical and Experimental Pharmacology and Physiology*, vol 23, no1, ss33–7.
- HS&H 1997, *Health Status of Victorian Women: A First Report*, Aged Community and Mental Health Division, Melbourne.
- Hunter S 1996, *Sexual Assault Policy Discussion Paper*, Office of Women's Policy occasional paper no 4, Darwin.
- Katherine Family Link 2000, *1999 Sexual Assault Data*, personal communication with the author
- Kidd PS & Sturt P 1996, *Mosby's Emergency Nursing Reference*, Mosby-Year Book Inc, Missouri.
- Kildea S 1999, *And the Women Said ...Reporting on Birthing Services for Aboriginal Women from Remote Top End Communities*, THS, Darwin.
- Kilgour R 1991, *Exploring Women's Health status—Data requirements*, NZ Department of Health, Wellington.
- KPMG Management Consulting 1996, *The Financial and Economic Costs of Domestic Violence in the Northern Territory December 1996*, Office of Women's Policy, Darwin.
- Lloyd J & Rogers N 1992, *Without Consent: confronting adult sexual violence*, Australian Institute of Criminology, Canberra.
- Mansfield C 1999, *Domestic Violence Presentations to the Royal Darwin Hospital Emergency Department October–December 1998*, Territory Health Services, Darwin.
- Manzie D 1992, *Sexual Abuse Discussion Paper*, NT Department of Law, Darwin.
- Markey G 1998, *The Health Status of Women in the Northern Territory*, Women's Health Strategy Unit, THS, Darwin.
- Markey PG, d'Espaignet ET, Condon JR & Woods M 1998, *Trends in the Health of Mothers and Babies, Northern Territory 1986–95*, THS, Darwin.
- Measey ML, d'Espaignet ET & Cunningham J 1998, *Adult Morbidity and Mortality due to Tobacco Smoking in the Northern Territory 1986–1995*, THS, Darwin.

- NHMRC 1997, *NBCC Annual Report 1996/97*, NHMRC, Canberra.
- NTH&CS 1995, *Sexually Transmitted Diseases Program Annual Report 1995*, AIDS/STD Unit, NTH&CS, Darwin.
- NSW Sexual Assault Committee 1984, *Report of the NSW Sexual Assault Committee to the Hon. Neville Wran Q.C., M.P Premier of NSW*, Sydney.
- Office of Women's Policy 1998, *Some Facts about Sexual Assault* (fact sheet), Office of Women's Policy, Darwin.
- O'Kane A 1994, *Sexual Assault Services in the Alice Springs Region*, Alice Springs Sexual Violence Action Group, Alice Springs.
- O'Reilly B & Townsend J 1999, *Young People and Substance Abuse in the Northern Territory in 1998*, THS, Darwin.
- Police Domestic Violence Unit (NT) February 2000, *Monthly Domestic Violence Statistics Summary*, personal communication.
- Plant AJ, Condon JR & Durling G 1995, *Northern Territory Health Outcomes, Morbidity and Mortality 1979–1991*, NTH&CS, Darwin.
- Rathman 1998, *Post Natal Depression Project Report*, Women's Health Statewide: Postnatal Distress, SA.
- Richards R & McComb J 1996, *Tobacco Consumption in Darwin October 1994*, Alcohol and Other Drugs Program, THS, Darwin.
- Road Safety Council of the NT 1998, *Northern Territory Road Accident Statistics 1997*, Road Safety Council of the Northern Territory and Department of Transport and Works, Darwin.
- Ruby Gaea House 1999, *Annual Statistics for 1998*, personal communication with the author.
- Sayers S & Powers J 1997, 'Risk factors for low birth weight, intrauterine growth retardation and preterm birth in the Darwin region', *Australian and New Zealand Journal of Public Health*, vol 21, no5, pp 524–530.
- Smith-Warner SA, Spiegelman D, Yaun SS and others 1998, 'Alcohol and breast cancer in women: a pooled analysis of cohort studies', *Journal of the American Medical Association*, vol 279, no 7, pp535–40.
- Thompson R & Hunter S 1997, *A Report on the Northern Territory Government Domestic Violence Strategy Data Collection Project*, Office of Women's Policy, Darwin.
- THS 1995 *The Sexual Assault Services Strategy for Territory Health Services* THS, Darwin
- THS 1996, *NT Food and Nutrition Policy 1996 and Five Year Strategic Plan*, THS, Darwin.
- THS 1998, *Territory Health Services Annual Report 1997–98*, NTGP, Darwin.
- THS 1999, *Women's Cancer Prevention Program*, Unpublished.
- Weeramanthri T 1998, *Finding the Right Balance— A Preventable Chronic Diseases Strategy for the NT*, Draft Paper, THS, Darwin.
- WHSU 1999, *NT Women's Health Policy*, Women's Health Strategy Unit issues paper, THS, Darwin.

Aboriginal health

an historical approach

by Edward Tilton (for the Aboriginal Medical Services Alliance Northern Territory)

This chapter aims to shed light on the current state of Aboriginal health in the NT and how it came to be the way it is. It is intended to help those working in the field and outside it to understand how and why the health of Aboriginal people is the way it is today, and what some future directions may be.

The historical analysis that follows aims to show that the changing patterns of Aboriginal health since colonisation cannot be reduced to a single dimension—the uncomplicated notion that Aboriginal health is either improving or deteriorating—which leads inevitably to naive optimism on the one hand or hopeless despair on the other. Rather, the changing patterns of Aboriginal health arise from changes in the relationship between Aboriginal people and the non-Aboriginal settlers; changes in Aboriginal people's ability to control their own lives, land and health; and changes in Aboriginal people's access to health services and the nature of those services.

Aboriginal health before first contact

Although it is difficult to judge the pre-contact health status of Aboriginal people in the NT in terms of the statistics that are now officially used to measure health, several factors would have led them to be relatively healthy compared with Aboriginal people today and possibly also 19th century Europeans: freedom from many of the infectious diseases that came with the invaders, Aboriginal peoples' access to and control over the land and its resources, and their own traditional medicines.

Many of the infectious diseases that are now, or have been, common among Aboriginal people were unknown before contact with non-Aboriginal people. It is difficult to be certain of the situation, because disease often spread ahead of the white people themselves (Hartwig 1965:30) and so first contact by white people was with Aboriginal people who had already been affected by those conditions. Yaws and trachoma probably existed before first contact, and malaria also existed among the coastal people in the north of the NT. Smallpox possibly existed in the north

before contact with white people, while leprosy and tuberculosis, later to be highly prevalent, were apparently unknown (Kettle 1991a:7).

Access to land and resources under traditional Aboriginal life guaranteed a good diet, an active lifestyle and a mobile, hunter-gathering way of life that inhibited the spread of infectious disease. Many early accounts mention the well-nourished and strong appearance of Aboriginal people in the early days of contact. John McDouall Stuart, the first white explorer in Central Australia, frequently refers to the inhabitants as being 'muscular', 'well-made' and 'in excellent condition' (Stuart 1984:11, 87, 253). These early descriptions are confirmed by photographs, such as those of Baldwin Spencer, which show healthy and fit-looking people (Spencer 1987). The evidence is that, although drought and famine would have made life hard at times, particularly in the desert of Central Australia, the continuing malnutrition that was to become prevalent later on was unknown.

Aboriginal people across the NT had their own systems of medicine for treating many of the ordinary sicknesses that occurred (Nathan & Leichlitner 1983: 130–55).

We should not assume that Aboriginal people lived in an illness-free paradise before the advent of white people. Nevertheless, the factors described above ensured that Aboriginal people were free of many of the health problems that followed colonisation. Infant mortality may have been high (Kirke 1970:6), but it was almost certainly less than that experienced on the artificial settlements of the mid-20th century (see over).

Aboriginal Medical Services Alliance Northern Territory

Established in 1994 by Aboriginal community-controlled health services from around the NT, the Aboriginal Medical Services Alliance Northern Territory (AMSANT) represents the interests of the community-controlled health sector in the NT, lobbies for positive changes in Aboriginal health and advocates for Aboriginal self-determination and community control.

Aboriginal health immediately after first contact

The period immediately following the arrival of white people was accompanied by a dramatic change in the health of the Aboriginal population, marked by high levels of illness (morbidity) and death (mortality) because of introduced diseases (some of which may actually have preceded the newcomers into the NT) and killings by the settlers as they attempted to wrest control of land from its traditional owners.

First contact between Aboriginal people and non-Aboriginal people took place at different times across the Territory: from the first white explorers of the north coast in the 1840s, to those of Central Australia in the 1860s and 1870s, even up to the 1960s when people of the Western Desert were 'brought in' by Native Welfare officials. Although the circumstances in particular areas were markedly different, some generalisations can be made.

The immediate effect of the arrival of Europeans was a rapid fall in the numbers of Aboriginal people. A number of estimates have been made of the population decline caused by disease and violence in Australia as a whole. Reynolds (1981:123) gives a decrease of Australian Aboriginal people from 300,000 to 50,000 during the century after 1788; others put the initial population slightly lower at around 250,000 (see Radcliffe-Brown's 1930s estimate in Rowley 1972:384) or the Aboriginal population at the end of the 19th century as slightly higher (Clarke 1981:1). Other estimates put the initial population much higher, at three-quarters of a million, and calculate a subsequent loss of 600,000 (Dr Peter White, quoted in *Land Rights News* 1987:19).

Accurate figures for the NT Aboriginal population before and after the arrival of Europeans are not available. However, we can assume the same general conditions occurred in the NT as elsewhere on the continent and that, whatever the exact figures, there was great loss of life, mainly through introduced diseases to which Aboriginal people had little or no resistance. Whooping cough, measles, influenza, tuberculosis, leprosy and smallpox, among many others, swept through the Aboriginal population, which was often already weakened by the growing difficulty of accessing water and bush foods as the white man and his cattle gradually took control of the land (Kettle 1991a:168).

As well as disease, war, massacres and frontier violence had a profound effect on the health (physical and surely also social and psychological) of Aboriginal

people. An initial period of tentative approach between the traditional owners and the settlers was often followed by violence, as Aboriginal people attempted to retain control over their land (Hartwig 1965:392). In different parts of the Territory, this was of differing severity. A number of major massacres from the 1870s onwards occurred across Central Australia, beginning with that at Barrow Creek in 1874 and not ending until the Coniston Massacre of 1928 (see Kimber 1991). It is impossible to know precisely the number of Aboriginal people who died in these events: figures for officially investigated massacres were unreliable, and many killings simply were never reported (Kimber 1991:7, Donovan 1988:157). Nevertheless, Kimber (1991:16) estimates that "upwards of 1,000 were shot in Central Australia", which would represent about 10% of the total population prior to contact. In addition to large scale killings, there were undoubtedly many unrecorded abuses of individuals that occurred outside direct frontier conflict, for example by bosses on stations, trackers and police.

In summary, the period shortly after the arrival of Europeans in the NT was marked by massive increases in illness and death among Aboriginal people, through introduced diseases and violence. During this time, health services to Aboriginal people were essentially non-existent.

Aboriginal health in the time of the settlements

After the period of initial warfare and disease, a new situation faced Aboriginal people. Unable to sustain their traditional way of life, they were compelled by circumstance or government agency to move to large settlements: today's 'Aboriginal communities'. Initially, these were run either by government welfare agencies or missions, or simply formed spontaneously on the outskirts of pastoral homesteads. In many instances, they were pools of cheap labour for the industries (predominantly pastoral) introduced by the white settlers.

Health conditions on these settlements varied widely over time and from place to place, but generally they were marked by high levels of sickness and infant mortality. Poor infrastructure, a less active lifestyle, dependence on a foreign system, poor nutrition, overcrowding and the stress of living in a way foreign to traditional life produced a situation in which disease ran riot. In addition, government responsibility for health was divided, there were very few health

services located on communities and the hospital system was characterised by segregation and discrimination.

Aboriginal people, and especially children, on the settlements suffered high levels of disease and death. In the mid-1960s, the infant mortality rate for the NT was 120 per 1,000 live births (Territory Health Services 1996:27). In Central Australian settlements, Kirke (1970:25) records an infant mortality rate in the mid 1960s of over 200 per 1,000 live births—in other words, over one-fifth of children died in the their first year of life. Kettle records even higher rates of infant mortality in the same period, including 290 deaths per 1,000 at Yuendumu in 1964 and an estimate of approximately 250 per 1,000 for Central Australia as a whole (1991b:214). This pattern of high levels of illness and infant mortality was seen elsewhere in Australia in the period following colonisation (Reynolds 1981:126).

These shocking figures resulted from a social and economic environment that could hardly have been worse for the health of its inhabitants. Traditional mobility, activity and access to bush foods high in fibre and low in fat had been replaced by a sedentary lifestyle, dependent on new foods that were often nutritionally inadequate (Kirke 1970). In addition, the settlements forced Aboriginal people from different language groups and geographical areas to live in close proximity, ‘all mixed up’. This led to high levels of stress and conflict, which can only have been exacerbated by people’s loss of autonomy in the face of the non-Aboriginal system that now attempted to rule every aspect of their lives.

Concentrated populations also meant that infectious disease spread rapidly: epidemics of measles, whooping cough, mumps, chickenpox and influenza caused many deaths, and tuberculosis and leprosy (in the north) were common (Kettle 1991b:205–14). For children, the major killer was gastrointestinal and respiratory tract infections (Kirke 1970:31; Kettle 1991b). With access to adequate primary medical care, these infections are rarely fatal; unfortunately, very little medical care was located in the communities where Aboriginal people lived. Many commentators identify the sheer lack of medical staff as a primary contributing factor to the high levels of infant deaths (see Kirke 1970:27; Kettle 1991b:203).

Although several attempts were made (some as early as before the First World War) to provide Aboriginal people with medical services, these rarely resulted in any significant presence of health staff in remote areas (see Kettle 1991a, 1991b). They were also

compromised by links with systems of colonial administration, as well as governmental disputes about responsibility.

Early medical services to Aboriginal people were often provided more for the benefit of the white population than the indigenous community, and Aboriginal ill-health was explicitly used to justify the need to control the indigenous population. Dr CE Cook, who was both Chief Medical Officer and Chief Protector in the NT in the 1920s and 1930s, wrote that the Aboriginal population (Cook to McEwen 1938, quoted in Parry 1992:337):

...had become the natural host of endemic disease by which successful white settlement is gravely menaced, and it is manifestly impossible for the hygienist, with any pretence to bona fides, to undertake the safeguarding of the health of the white community and its future unless he has full powers over the native population, not only in regard to treatment for apparent ailment, but also in relation to hygiene, community life, migration and dispersion through the white community.

Further problems arose from governmental confusion about responsibilities. After the Second World War, for example, government Aboriginal settlements were run by the Welfare Branch of the NT Administration; yet the Commonwealth Health Department was supposedly responsible for health in the Territory. Arguments went back and forward about who was responsible for health services on remote communities until 1973, when the Commonwealth Health Department accepted responsibility for the provision of these health services (Kirke 1970: 9; Kettle 1991b:231). In the meantime, Welfare Branch provided some services, the Commonwealth’s NT Medical Services others, and the missions others again.

Kirke’s study illustrates the results of the administrative confusion in responsibility: he records an infant mortality rate of 83 per 1,000 on missions, which were unified under one administration and had less difficulty retaining staff, but double that on stations and Central Australian government settlements, which were marked by high staff turnover and their lack of say in the administration of settlements (Kirke 1970:27).

Conditions at the few centrally located hospitals were also problematic. Government hospitals were not set up outside Darwin until the 1930s, and even then ran into problems. Early attempts to create one in Alice Springs were opposed by many white residents, who had access to a mission hospital, on the basis that,

were it to be taken over by the government, the hospital would have to treat Aboriginal people (Donovan 1988:177).

Later, cross-infection in overcrowded and poorly-resourced wards was a major concern for health staff. Segregation of hospital wards into those for Aboriginal people and those for the white population exacerbated the problem: well-resourced wards set aside for non-Aboriginal people stood half-empty while Aboriginal wards were severely overcrowded, with patients being treated on verandahs and people with infectious diseases being located with nursing mothers and children (Kettle 1991b:222–7).

In summary then, the time of the settlements until the late 1960s was marked by very high levels of infant death and sickness, resulting from the poor physical and social environment and widespread lack of access to basic medical services. This was partly a reflection of the place of medical services within the colonial system, but also resulted from division and conflict within the bureaucracy over which part of government should accept responsibility for Aboriginal health.

Aboriginal health in the time of self-determination

The 1960s saw a resurgence of Aboriginal activism and renewed demands for rights and services in many areas of life—legal, civil and political, and land rights as well as the right to good health. The legal framework for the success of these movements was laid in the 1960s, with the 1967 Referendum giving Aboriginal people citizenship rights and giving the Commonwealth responsibility to legislate for Aboriginal people across Australia. In the 1970s, a network of community-controlled Aboriginal organisations was built on this foundation: legal services, land councils, housing associations and community-controlled health services.

One of the results of these changes was improved access to primary medical services (see inset) on Aboriginal communities and, through these, to other health care institutions. This was due in part to the achievement of many legal, civil, political and land rights by Aboriginal people, the creation of a number of community-controlled health services, and the Commonwealth health department's acceptance of responsibility for improving Aboriginal health. Official segregation within hospitals ended, and more resources were devoted to the area of Aboriginal health. As a result, infant death rates began to drop steadily and significantly.

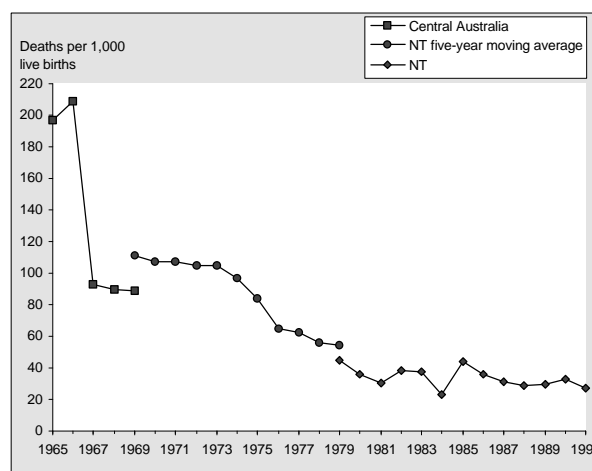
Primary health care and Aboriginal health

Primary health care has two interpretations. The narrow definition (which we distinguish by calling it 'primary medical care') focuses on the provision of medical services that treat individual medical conditions. It forms only a part of comprehensive primary health care, which is a broader, holistic approach to health problems. As well as providing primary medical care, comprehensive primary health care addresses a range of health concerns that have no specific medical intervention. This distinction is crucial to understanding the changing patterns of Aboriginal health in the NT since the 1960s.

Infant mortality: a crude measure of Aboriginal health

Mortality, both infant and adult, is a crude measure of the health of populations. Nevertheless, it has the advantage of being measurable in a way that illness, affected as it is by the issue of access to health services, is not.

14.1 NT Aboriginal infant deaths, 1965 to 1991



Sources: 1965–69, Central Australia only—Kirke 1970
1969–79, NT—NTH 1979
1979–91, NT—Plant & others 1995

The period since the early 1970s has seen a significant shift in the patterns of ill health suffered by Aboriginal people in the NT. The most important of these is that infant mortality has dropped significantly (graph 14.1). Infant mortality on some Central Australian Aboriginal communities was well over 200 per 1,000 live births in the mid-1960s. By the mid-1970s, the NT rate had already come down to somewhere in the region of 100 per 1,000 (NTH 1979:47). Towards the end of the decade, it had roughly halved again (Plant & others 1995:203). There was a slight reduction during the 1980s, to leave it at around 30 deaths per 1,000 at the

beginning of the 1990s (Plant & others 1995:203, but see also Bhatia & Anderson 1995:37).

Despite these improvements, the rate at the beginning of the 1990s was still over three times that of the non-Aboriginal NT population (Plant & others 1995:203).

There were a number of reasons for the dramatic fall in Aboriginal infant mortality during this period. First was the increased access to primary health care on Aboriginal communities, delivered by both the government and non-government sectors. Significant here was a modest increase in resourcing for primary health care. The new medical services, under government or community control, ensured that children suffering from diarrhoeal and respiratory infections, which earlier had proved fatal, were treated by locally-based health workers, and if necessary, evacuated to hospital (Scrimgeour 1997:24).

Further, the decision by the Commonwealth health department to accept responsibility for Aboriginal health services from the beginning of 1973 unified the administration of government health services for indigenous communities (though it should be noted that at the same time the new Department of Aboriginal Affairs began funding community-controlled health services). Such unified responsibility has been identified as one of the necessary conditions for successfully addressing indigenous health (see Kunitz and Brady 1995).

Similarly, increases in hospital resourcing had their effect, as did the ending of segregation in NT hospitals in 1969; this meant that the under-utilised wards which had been set aside for Europeans were now available for Aboriginal citizens as well (Kettle 1991b:227).

This was also the period when Aboriginal community-controlled organisations, including Aboriginal medical services, were established, and their effect on the changes outlined above was decisive. The Aboriginal medical services greatly increased Aboriginal people's access to primary health care (Kunitz & Brady 1995:553). Central Australian Aboriginal Congress' (CAAC) medical program started in 1975, followed by services in Utopia in 1977, Papunya and the Pitjantjatjara Homelands in 1978, Kintore in 1984 and Tennant Creek shortly afterwards. The creation of such community-controlled health services, funded largely by the Commonwealth, has continued into the 1990s with Wurlu Wurlinjang in Katherine (1990) (although Kalano, the Aboriginal housing association, also ran a health service in Katherine during the

1980s); Danila Dilba in Darwin (1991); and Miwatj at Nhulunbuy (1992) (Scrimgeour 1997:26–34).

Staffed mainly by doctors and Aboriginal health workers, and under the direct control of the Aboriginal community, these services have accounted for an increasingly large proportion of the primary health care delivered to Aboriginal people in the NT. Today, in the Central Australian region, 45% of the Aboriginal population is serviced by Aboriginal medical services. By comparison, government clinics service 35% of the population, grant-in-aid services supply 5%, and 15% have no primary health care service (Bartlett & others 1997:42). At the time of writing, similar information is not readily available for the Top End of the Northern Territory.

The community-controlled health services were, from the beginning, explicitly political organisations and vehicles for Aboriginal self-determination. They therefore saw their role as extending beyond mere delivery of medical and other services to advocacy for the necessary steps at the policy and resourcing levels to tackle Aboriginal ill health. This has led to some conflict at times with government organisations (Scrimgeour 1997:41), but has been crucial in keeping the issue on the national agenda. This influence can be seen in the key studies that still form the basis of modern Aboriginal health policy: the National Aboriginal Health Strategy (1989) and the Royal Commission into Aboriginal Deaths in Custody (1991), both of which recommend Aboriginal control of primary health care services.

In more recent times, the transfer of responsibility for Aboriginal health from the Aboriginal and Torres Strait Islander Commission to the Commonwealth health department in 1995, and subsequent increases in funding for Aboriginal primary health care, from approximately \$85 million in 1994–95 to about \$166 million in 1998–99 (Australian National Audit Office 1998:29) were largely the result of pressure from community-controlled health services and their umbrella organisations such as AMSANT.

There is no doubt that the development of Aboriginal organisations in other sectors—for example, housing, legal, land and education—also played a major role in the health changes of the 1970s and 1980s. Powerlessness is being acknowledged today to be a major health risk in itself, and the development of Aboriginal organisations in the 1960s and 1970s tackled the dependent status of Aboriginal people by giving them a base from which to deal with their own problems in their own way, instead of being dependent on non-Aboriginal action.

In addition to this, the concrete achievements of the new organisations in achieving the rights of Aboriginal people were significant in bringing about health improvements. For example, rights to land (gained under the 1976 *Northern Territory Land Rights Act*) allowed some Aboriginal people to move away from settlement life and all the health problems it contained, back to homelands and outstations where a healthier lifestyle was possible. The positive health effects of this movement, long asserted by Aboriginal people themselves, is now receiving scientific confirmation (see, for example, McDermott & others 1998).

So, from the late 1960s onwards, the increase in access to basic medical care, the acceptance of responsibility for Aboriginal health by the Commonwealth government and the creation of the Aboriginal organisations, especially community-controlled health services, led to significant improvements in the health of Aboriginal people in the NT, most notably in the form of a decline in the infant mortality rate.

Comprehensive primary health care and beyond

Despite the improvements since the 1960s, life expectancy remains almost twenty years less for Aboriginal people compared with non-Aboriginal people at the end of the twentieth century. Access to basic medical services, although by no means complete, has reduced the deaths of infants; even so, infant mortality is still three times the national average.

The fall in infant mortality rates is, however, only part of the story. Aboriginal childhood illness, as measured by hospital visits, has not apparently improved over the same period (Plant & others 1995:19). Also, in the older age groups, there has been no similar improvement in Aboriginal death rates; indeed, they may have worsened over the last thirty years or so (Bartlett & Legge 1994:4; see also Bhatia & Anderson 1995:12–13).

In other words, today, Aboriginal people are surviving childhood only to die prematurely in adulthood. The causes of increased adult deaths are many and various, but in general they are lifestyle-related. They are to do with alcohol and other substance abuse, violence, and dietary and nutrition matters, all embedded within a particular psychological, social, economic and political environment.

The step needed to address the current health situation is to go beyond primary medical care to the implementation of universal access to comprehensive primary health care. At the same time, many of the determinants of Aboriginal health lie outside the health sector. Aboriginal health cannot be quarantined from the effects of developments in such areas as legal and land rights, education, employment and infrastructure.

Years of potential life lost

Years of potential life lost is not a measure of the leading causes of death among Aboriginal people but, rather, of what causes the most years of life to be lost before age 65. It reflects what many people see as the central tragedy of contemporary life: that young to middle-aged Aboriginal adults are dying when they have potentially so many years ahead of them.

14.2 NT Aboriginal men and women, top five causes of years of potential life lost 1979 to 1991

	Total YPLL	Percentage of Total
Men		
1. Motor vehicle accidents	5,994	17
2. Ischaemic heart disease	3,415	10
3. Homicide	2,594	8
4. Pneumonia / Influenza	2,054	6
5. Rheumatic Heart disease	1,234	4
Women		
1. Homicide	2,140	11
2. Rheumatic Heart disease	1,556	8
3. Motor vehicle accidents	1,428	7
4. Ischaemic heart disease	1,006	5
5. Chronic obstructive pulmonary disease (excluding asthma)	943	5

Notes: Aboriginal men and women aged 15 to 64 years
‘YPLL’ is years of potential life lost before age 65

Source: Adapted from Cunningham & Condon 1996

Of the top five causes of years of potential life lost in NT Aboriginal men and women (table 14.2), the only precise medical intervention to prevent any of these conditions is that for pneumococcal pneumonia—which is only a portion of the fourth most serious causes of years of life lost in NT Aboriginal men. A vaccine is available to prevent this condition. Apart from that particular case, we can say that there is no clear-cut medical intervention which prevents any of the top five causes of premature death among Aboriginal men and women.

In other words, while better access to medical care, including primary medical care, from the 1970s onwards has reduced the rate of deaths for Aboriginal children, medical care by itself cannot prevent the conditions that are the major causes of excess mortality in NT Aboriginal people today. However, this point must be accompanied by two important qualifications.

First, primary medical care can play an important role in detecting and managing many of the so-called lifestyle-related diseases of today, often preventing premature death while not preventing the condition arising in the first place. For example, while there is no specific medical intervention for preventing renal disease, access to good medical care is essential to ensure that the condition is monitored and managed and that it does not develop into renal failure, with its risk of death (see Devitt & McMasters 1998).

Second, access to primary medical care, while greatly improved is still not at an adequate level. The Central Australian Health Planning Study (1997:67) found that health staffing levels (Aboriginal health workers, doctors or nurses) for the region were approximately half of what they ideally should be. Some smaller communities have no resident health staff and rely on visiting practitioners. Similar information is not yet available for the Top End of the Northern Territory.

With these qualifications in mind, however, we can assert that further major improvements in the health of Aboriginal people require communities to have access at least to comprehensive primary health care services; services that address both the immediate medical needs and the long-term causative health concerns of a community. AMSANT has defined a comprehensive primary health care service as including (CAAC & AMSANT 1998):

- a clinic for medical care, both acute and preventive—including immunisations and screening programs
- support for the primary health care service, including management and administration, and education for health staff
- special health programs that address problems for which there is no effective medical intervention, and which require community action to be effective

In other words, although health services must obviously include access to medical care when people are sick, Aboriginal communities also need to be able to use health services to tackle the non-medical health problems—such as those of substance abuse (alcohol, petrol), violence and suicide—that underlie much ill

health. These programs require local community control and action for them to be effective; the community itself needs to be able to determine what the problems are and how to act on them. Community control of health services is now universally recognised, in theory at least, as an essential part of tackling ill health on communities (Scrimgeour 1997:46–7).

The historical analysis presented above illustrates that, although the health sector is important in addressing the ill health of Aboriginal people, many of the determinants of health fall outside that sector. The health of Aboriginal people is affected by other aspects of Aboriginal life such as access to land, good nutrition, education and meaningful employment.

In the words of the National Aboriginal Health Strategy (1989:ix): *'Health' to Aboriginal peoples is a matter of determining all aspects of their life, including control over their physical environment, of dignity, of community self-esteem, and of justice. It is not merely a matter of the provision of doctors, hospitals, medicines or the absence of disease and incapacity... Health is not just the physical wellbeing of the individual, but the social, emotional and cultural wellbeing of the whole community.*

This definition echoes that adopted by the World Health Organization at the 1978 Alma-Ata International conference on Primary Health Care which defined health as... *a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity... a fundamental human right.*

Recently CAAC & AMSANT (1998) identified a number of factors, besides access to comprehensive primary health care, which affect the health of Aboriginal people. They include identity, economic activity, appropriate physical infrastructure, appropriate education, good nutrition, active culture and community leadership. There are a number of implications of this holistic approach.

First, there are no simple, one-dimensional solutions to the problem of Aboriginal health. Medical services, education, employment, infrastructure: all of these things are necessary, but not sufficient by themselves for Aboriginal people to have the kind of health status enjoyed by the rest of Australia.

Second, it is not possible to 'quarantine' other areas of Aboriginal lives from health. Reducing land rights, legal services, and employment and education

programs will ultimately have the effect of worsening the health of Aboriginal communities.

Third, restoring the health of Aboriginal people will take some time, during which they will continue to be sicker and die younger than other NT residents. During this time, they obviously need access to health services. Aboriginal people cannot be asked to wait for improvements in other aspects of their lives, such as education, employment and infrastructure, that will lead to some notional, future state of better health.

References

- Australian National Audit Office 1998, *The Aboriginal and Torres Strait Islander Health Program, Department of Health and Aged Care: Performance Audit*, report no 13, Canberra.
- Bartlett B & Legge D 1994, *Supporting Aboriginal Health Services: a Program for the Commonwealth Department of Human Services and Health*, CAAC, Alice Springs, & NCEPH, Canberra.
- Bartlett B, Duncan P, Alexander D & Hardwick J 1997, Central Australian health planning study: final report (unpublished report), Office of Aboriginal and Torres Strait Islander Health Services, Canberra.
- Bhatia K & Anderson P 1995, *Overview of Aboriginal and Torres Strait Islander Health: Present Status and Future Trends*, AIHW, Canberra.
- CAAC & AMSANT 1998, The Ilpurla statement (unpublished paper), Alice Springs.
- Clark CMH 1981, *A History of Australia*, vol 5, Melbourne University Press, Australia.
- Cunningham J & Condon J 1996, 'Premature mortality in Aboriginal adults in the Northern Territory, 1979–1991', *Medical Journal of Australia* vol 165, no 6, pp 309–12.
- Declaration of Alma-Ata <http://www.who.dk/policy/almaata.htm>
- Devitt J & McMasters A 1998, *Living on medicine: a cultural study of end-stage renal disease among Aboriginal people*, IAD Press and CAAC, Alice Springs.
- Donovan PF 1988, *Alice Springs and the People who Made It*, Alice Springs Town Council, Alice Springs.
- Hartwig M 1965, The progress of white settlement in the Alice Springs district and its effect upon the Aboriginal inhabitants 1860–1894, PhD thesis, University of Adelaide.
- Kettle ES 1991a, *Health Services in the Northern Territory: a History 1824–1970*, vol 1, ANU NARU, Darwin.
- Kettle ES 1991b, *Health Services in the Northern Territory: a History 1824–1970*, vol 2, ANU NARU, Darwin.
- Kimber RG 1991, *The end of the bad old days: European settlement in Central Australia, 1871–1894*. State Library of the Northern Territory occasional paper no 25, Darwin.
- Kirke D 1970, Aboriginal infant and toddler mortality and morbidity in Central Australia 1965–1969, MD thesis, University of Adelaide.
- Kunitz S & Brady M 1995, 'Health care policy for Aboriginal Australians: the relevance of the American Indian experience', *Australian and New Zealand Journal of Public Health*, vol 19, no 6, pp 549–58.
- Land Rights News 1987, 'British Invasion claimed 600,000', Northern Land Council, vol 2, no 3, p 19.
- McDermott R, O'Dea K, Rowley K, Knight S & Burgess P 1998, 'Beneficial impact of the homelands movement on health outcomes in central Australian Aborigines', *Australian and New Zealand Journal of Public Health*, vol 22, no 6, pp 653–8.
- Nathan P & Leichlitner Japanangka DL 1983, *Health Business: a Community Report for the Central Australian Aboriginal Congress and its People*, Heinemann Educational Australia, Melbourne.
- National Aboriginal Health Strategy Working Party 1989, *National Aboriginal Health Strategy*, Department of Aboriginal Affairs, Canberra.
- NTH 1979, 'Maternal and Infant Mortality in the Northern Territory 1974–1979', supplement to *The Bulletin*, no 26.
- Parry S 1992, Disease, medicine and settlement: the role of health and medical services in the settlement of the Northern Territory 1911–1939, PhD thesis, University of Queensland.
- Plant AJ, Condon JR & Durling G 1995, *Northern Territory Health Outcomes: Morbidity and Mortality 1979–1991*, NTH&CS, Darwin.
- Reynolds H 1981, *The Other Side of the Frontier*, Penguin, Australia.
- Rowley C 1972, *The Destruction of Aboriginal Society*, Penguin Books, Melbourne.
- Scrimgeour D 1997, *Community Control of Aboriginal Health Services in the Northern Territory: a Report prepared for Territory Health Services*, Menzies School of Health Research occasional paper 2/97, Alice Springs.
- Spencer B 1987, *The Aboriginal Photographs of Baldwin Spencer*, Viking O'Neil for National Museum of Victoria Council, Melbourne.
- Stuart JM 1984 [1865], *Explorations in Australia: The Journals of John McDouall Stuart*, Hesperion Press, Perth.
- Territory Health Services 1996, *Aboriginal Health Policy*, Government Printer of the Northern Territory, Darwin.

Health services

Community health services

by Christine Connors, Jenny Woodhouse (Urban community health services), Edward Tilton (Community-controlled health services—for the Aboriginal Medical Services Alliance Northern Territory) and Jenny Cleary (Coordinated care trials)

The NT has developed a unique system of community health service provision in response to the high rates of Aboriginal illness and death, limited availability of health professionals and geographical remoteness of population centres within the Territory. This chapter outlines community health infrastructure in the NT.

Improving the health status of Aboriginal people is the greatest challenge for community health services in the NT. Poor living conditions, low literacy rates, high unemployment and poverty are major contributors to the continuing ill health of Aboriginal people (see the Underlying causes chapter). Urban community health staff focus on primary health care and public health programs. Aboriginal health workers and remote area nurses provide most of the primary health care in remote areas.

The NT's two largest urban areas, Darwin and Alice Springs, are similar to other Australian cities in that they have a primary care service that is provided primarily by private general practitioners. However, even in these towns, a significant proportion of the population accesses health care through community health centres, run by either Aboriginal community-controlled health services or Territory Health Services.

Because there are few private doctors and no private pharmacies outside the NT's five main urban areas—Darwin, Alice Springs, Katherine, Tennant Creek and Nhulunbuy—NT residents in remote areas have limited access to the Commonwealth-subsidised Medical Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS). The resulting estimated annual shortfall is \$45 million a year (THS 1998).

The logistics of providing equitable access to health services are further challenged because the NT's numerous small communities are spread across huge distances. In 1996, 27% of NT people lived in rural and remote areas compared with 12% of people in NSW and Victoria (ABS 1997). Other factors that increase the difficulties of providing appropriate health services in the Territory include:

- high staff turnover in remote communities and small towns (see The health workforce chapter)
- a high proportion of people from diverse cultural backgrounds, many of whom speak languages other than English.

Urban community health services

In NT urban areas, there are a range of health service providers, both private and public. The NT's main urban areas—Darwin, Alice Springs, Katherine, Tennant Creek and Nhulunbuy—have access to resident and/or visiting private health providers, including:

- general practitioners
- allied health practitioners, such as dentists, physiotherapists and optometrists
- complementary therapists, such as acupuncturists, chiropractors and naturopaths

Each main urban area has at least one community-controlled health service (Aboriginal medical service) that provides general primary health care at a clinic and outreach services to town camps.

Other private health service providers include community-based organisations—examples are Family Planning NT, Diabetes Australia and the Cancer Council of the NT—and patient support groups such as the Asthma Foundation and the NT Association for Mental Health.

The defence forces provide primary health care services for their staff in Darwin and Katherine. In Darwin, the four military bases are staffed by medical officers, dentists, physiotherapists, psychologists and social workers. Their Katherine facilities include capacity for ten inpatients. The Joint Defence Facility has a medical clinic in Alice Springs that provides medical services for the American employees of Pine Gap.

The NT government provides a range of integrated health and welfare services in all NT urban areas, mainly through THS community care centres.

General practitioners

In Darwin's more established suburbs, the ratio of general practitioners per head of population approaches that of interstate metropolitan areas. Their patients are mainly non-Aboriginal as most Aboriginal people access general practitioners through community-controlled health services, community

care centres or Royal Darwin Hospital. In 1998, Alice Springs had 22 general practitioners; Katherine, Tennant Creek and Nhulunbuy all had limited general practitioner services (Kennedy 1998).

A 1994 study found that Top End general practitioners were more likely than their Australian counterparts to be young, female and employed part-time (Todd 1995).

Private allied health providers

Most allied health professionals in private practice are based in the NT's larger urban areas, and some provide a visiting service to the smaller towns.

15.1 NT private allied health providers 1998

Provider Type	Darwin	Alice Springs	Katherine	Tennant Creek	Nhulunbuy
Dentists	25	8	1	1	1
Optometrists	14	5	1(2)	(2)	(1)
Physiotherapists	16	5	1	1	0
Occupational therapists	5	0	0	0	0
Podiatrists	1.5	(1)	0	0	(1)
Psychologists	17	3	0	0	0
Speech therapists	3	0	0	0	0
Pharmacies	15	5	2	1	1

Note: Numbers may include part-timers
Numbers fluctuate in the smaller urban areas
Numbers in parentheses indicate visiting service provided from a larger urban area

Source: Adapted from Kennedy 1998

Compared with the NT's other towns, Darwin and Alice Springs are relatively well-supplied with private allied health providers (table 15.1).

Complementary therapists

15.2 NT complementary therapists 1998

	Darwin	Alice Springs
Acupuncturists	3	0
Chiropractors	11	5
Massage therapists	18	4
Naturopaths	7	1

Source: Adapted from Kennedy 1998

A range of complementary therapists practise in the NT's two main urban areas (table 15.2).

Divisions of general practice

Divisions of general practice are a national initiative to promote improved clinical and public health services through general practitioners. The Commonwealth established two divisions of general practice in the NT in 1994: the Central Australian Division of General Practice, which is based in Alice Springs; and the Top End Division of General Practice, which is based in Darwin.

The divisions provide a forum for general practitioners to contribute to health policy and planning, coordinate and support continuing medical education, provide support to general practitioners in urban and remote areas and receive funds from the Commonwealth to undertake projects—examples include training remote area staff to identify gut parasites, and working with general practitioners to improve immunisation services and the management of people presenting with anxiety problems.

Urban community-controlled health services

Urban community-controlled health services are staffed by Aboriginal health workers and, in most cases, salaried doctors. For more information about community-controlled health services in the NT, see the section later in this chapter.

15.3 Consultations at Danila Dilba and an Australian general practice

Rank	Problem	Per Cent of Consultations	
		Danila Dilba	Australian GP
1	Scabies	7.9	0.1
2	Localised skin infection	7.5	0.6
3	Diabetes mellitus	6.5	1.9
4	Upper respiratory tract infection	5.7	7.1
5	Hypertension	5.5	9.5
6	Immunisation	5.5	3.3
7	Boil/cellulitis	4.9	0.7
8	Chronic alcohol abuse	3.6	0.4
9	Heart failure	3.4	1.6
10	Acute bronchitis/bronchiolitis	3.3	3.5

Note: The most common health problems at an urban community-controlled health service and an Australian general practice

Source: Thomas 1995

A study of consultations at Darwin's community-controlled health service demonstrated significant

differences in common health problems managed at Danila Dilba compared with an Australian general practice (graph 15.3).

NT government community health services

The NT government provides a range of integrated health and welfare services in all NT urban areas, mainly through THS community health centres.

In Darwin, THS provides these services through community care centres, which have a multidisciplinary approach to clinic and home-based services. Core services include:

- health advice for mothers and children
- nurses who visit housebound clients
- nurses who screen primary school children for eyesight, hearing and coordination problems
- family support services
- nurses who provide clinical treatment

Other specialist work units that support community care centres include palliative care, aged care assessment teams, and allied health services such as speech pathology and physiotherapy.

In urban areas outside of Darwin, nursing services are the main focus of community health clinics, with other health and welfare services being provided through local THS offices.

In all NT urban areas, THS provides dental health services to high school students and disadvantaged adults; dental therapists provide a free dental service to preschools and primary schools. For more information, see the Dental health chapter.

Bridging the gap between hospital and community-based care

Darwin's Royal Darwin Hospital includes a self-care centre that is managed by the hospital but staffed by the local community care centre. It supports people who require short-term support in the transition between hospital-based care and their return home.

In each of the NT's main urban areas, a care coordination program manages the health care of people who have high support needs, including those with several illnesses. The aim is to assist those with complex health care needs to live independently in the community by providing a single access point for information and assessment.

Community-controlled health services

Beginning in the 1970s, community-controlled health services (also known as independent health services or Aboriginal medical services) were set up by the Aboriginal community in response to the continuing poor health of Aboriginal people and the lack of an effective government response. The first community-controlled health service in the NT was Central Australian Aboriginal Congress (CAAC), established in Alice Springs in 1973. Established initially as an organisation to represent the Aboriginal people of Central Australia in their campaign for self-determination, CAAC established a medical service in 1975.

By 1999, there were 12 community-controlled health services in the NT, mostly in remote Aboriginal communities. They are major health service providers: in the late 1990s, between them they provided approximately 120,000 clinical consultations per year as well as a large number of other health-related interventions. In urban and remote areas of the Central Australian region in 1997, Aboriginal medical services provided health care for 45% of Aboriginal people; THS 35%; grant-in-aid services (see the section on remote community health services later in this chapter) 5%; and 15% had no primary health care service (Bartlett & others 1997).

There is a great diversity in the services and structures of community-controlled health services, brought about by the differing needs of the communities they serve. They range from large, urban-based organisations, which provide a wide range of medical, social and support services, to more limited operations based in remote communities that provide services to several hundred people scattered in outstations across many thousands of kilometres. There are, however, some key elements of community-controlled health services, which are:

- their principal function is to provide primary health care to Aboriginal people
- they are controlled by the Aboriginal community that they serve—this means they are legally incorporated and governed by a board elected annually by the Aboriginal community
- most of their funds are from the Commonwealth government through the Office of Aboriginal and Torres Strait Islander Health (OATSIH) in the Department of Health and Aged Care
- they are committed to comprehensive primary health care

- they are autonomous of government, thus enabling them to develop health services according to local, rather than centrally determined, needs.

Community control is the ability for the people who are going to use services at the local level to determine the nature of those services, and then participate in the planning, implementation, and evaluation of those services. The National Aboriginal Health Strategy (1989) stated:

Community control is the local community having control of issues that directly affect their community. Implicit in this definition is the clear statement that Aboriginal people must determine and control the pace, shape, and manner of change and decision-making at [all] levels.

In their emphasis on community control, Aboriginal medical services embody nationally and internationally recognised best practice for the delivery of primary health care, as identified, for example, in the World Health Organization's Alma-Ata Declaration of 1978, which stated that it:

. . . requires and promotes maximum community and individual self-reliance and participation in the planning, organisation, operation and control of primary health care, making fullest use of local, national and other available resources.

One of the roles that local community control allows—even demands—of Aboriginal medical services is that of a more generalised advocacy for the health of Aboriginal people. In other words, their role often goes beyond the provision of health services, to advocating for the kind of policy settings that will best promote Aboriginal health, as well as assist Aboriginal communities to develop and participate in their own health services.

An important development of community-controlled health services in the NT was the creation of the Aboriginal Medical Services Alliance Northern Territory (AMSANT) in 1994. All of the NT's independent health services are members of AMSANT, and associate membership is open to other groups and organisations on request (for information about AMSANT's aims, see the Aboriginal health chapter).

AMSANT, THS, the Commonwealth Department of Health and Family Services and ATSIC signed the NT Aboriginal framework agreement in April 1998. This agreement aims to improve health outcomes for NT Aboriginal and Torres Strait Islander peoples by:

- improving their access to mainstream health programs

- increasing the level of resources to Aboriginal health services
- establishing a joint planning process to improve cooperation and coordination of services
- formal participation of Aboriginal and Torres Strait Islander peoples in setting priorities

Remote community health services

In this chapter, 'remote' refers to health services outside the NT's five urban centres of Darwin, Alice Springs, Katherine, Tennant Creek and Nhulunbuy. Because most people who live in remote areas of the NT are Aboriginal, this description of remote health services focuses on services to Aboriginal communities.

Organisation of remote health services

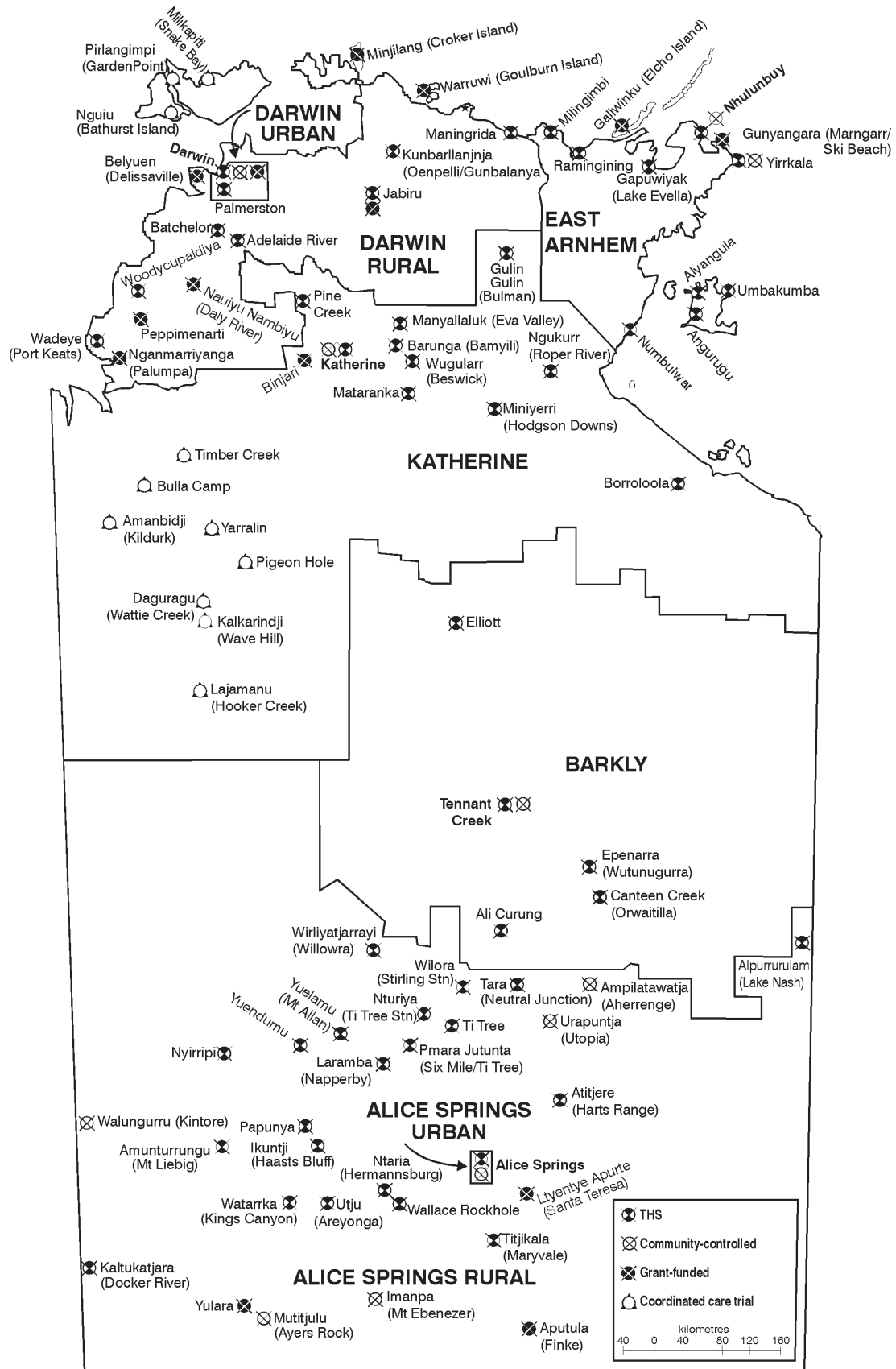
Structure and funding

In the late 1990s, community health services in remote communities were funded by a mixture of Commonwealth and NT money, and had a mix of organisational structures (see map 15.4). The different models include community health services that are:

- directly funded by the NT government, with all staff employed by THS
- NT-funded (through grants), with local councils or, occasionally, health boards responsible for employing staff and directing the health service
- Aboriginal community-controlled services that receive a mix of NT and Commonwealth funding or direct Commonwealth funding and are run by a dedicated Aboriginal health board which employs their staff

Some THS and grant-funded services also receive small amounts of direct Commonwealth funding, usually to provide support services to older people—examples are Meals on Wheels and transport assistance. A new model in the late 1990s is coordinated care trials, in which Commonwealth and NT health funds are provided to an incorporated health board that purchases health services for their community (see the section later in this chapter).

15.4 NT community health services with resident staff



Notes: Services with resident staff at 30 May 1999; many outstations receive visiting services
 Community-controlled means independent or Aboriginal medical service
 Grant-funded means a service for which a local council or health board is responsible

Source: Darwin Rural Services, THS

Remote area staff

Health staff either reside in remote communities or visit from one of the NT's five main urban areas. Communities range in size from family groups at outstations, usually with no resident health staff, to large communities of up to 2000 people. In the late 1990s, an average community of about 500 people would have three or four Aboriginal health workers, two remote area nurses and a cleaner.

15.5 NT health personnel in remote communities

Resident	Visiting
<ul style="list-style-type: none"> • Aboriginal health workers • Administrators • Cleaners • Clinic managers • Community family workers • Community nutrition workers • Drivers • Ear health workers • Environmental health workers • Gardeners • General practitioners • Mental health workers • Remote area nurses • Strong Women workers 	<ul style="list-style-type: none"> • Aerial medical nurse • Aged & disability team • Audiologist • Communicable Disease Centre doctors and nurses (TB control, STD screening, immunisation) • Dental therapist • Dentist • District medical officer • Environmental health officer • Social worker • Health promotion officer • Medical specialist (physician, paediatrician, surgeon, obstetrician or gynaecologist, ophthalmologist, ear nose and throat specialist) • Mental health team • Nutritionist • Occupational therapist, physiotherapist, speech therapist • Optometrist • Radiographer • Womens health educator

Note: Most services provided by THS staff

Data: Darwin Rural Services, THS

A wide range of services is provided by health personnel who reside in or visit remote NT communities (table 15.5), although the numbers in any given group are small.

Aboriginal health workers

Aboriginal health workers and remote area nurses work closely together, providing acute care as well as public health programs.

A unique role for Aboriginal health workers is that of 'cultural broker', in which they:

- provide their local community with information about illnesses
- act as a mediator between Aboriginal patients and the Western medical system
- provide non-Aboriginal staff with important local and cultural knowledge

Remote area nurses

Remote area nurses range in experience and skill from new graduates to highly-experienced bush nurses. Using guidelines developed in the NT, they diagnose and decide on treatment for a number of acute illnesses. They need to be able to act as independent practitioners, despite having no formal training for this role, as well as cope with culture shock, language barriers and living in a remote area.

General practitioners

Although resident doctors had been employed by Aboriginal community-controlled health services for several years, by the late 1990s remote communities in the NT were benefiting from Commonwealth initiatives to increase doctors in all rural and remote areas of Australia. In remote areas, very few general practitioners work as private practitioners; most are employed through Commonwealth grants and the allocation of Medicare funding to local councils or health boards.

Visiting health professionals

Community health staff in NT remote areas are supported by visiting health professionals, who provide clinical and public health services. Most are employed by THS, although some private service providers, such as radiographers and optometrists, regularly visit a few communities.

Visiting health professionals rely on local health staff or community members to provide ongoing services, which often results in excess demands on remote area nurses and Aboriginal health workers.

Primary health care

Primary health care is holistic, essential health care that involves the local community in decision-making about their health needs and how to address them. It is built on evidence-based medicine, promotes collaboration between all services that impact on health—such as education, water, sewerage, electricity and housing providers—and involves multidisciplinary teams in addressing health problems (see table 15.5).

The services provided in remote communities include 24-hour emergency treatment for sicknesses that range from minor illnesses to life-threatening conditions—from the common cold to heart attacks—and primary health care programs that focus on education, prevention and early detection.

Sickness care

Much clinic time is spent providing ‘sickness care’—that is, caring for people who are acutely unwell—as opposed to education, prevention and regular follow-up of people with long-term illnesses. The emphasis on ‘sickness care’ is a result of the high rates of illness and death in remote NT communities, combined with problems such as high staff turnover, giving rise to limited staff numbers and staff inexperienced in delivering primary health care.

Data from 21 Central Australian communities revealed that, in 1997, the average number of clinic visits per hundred people varied between 55 and 220 visits per month. Given that an average-sized community numbers 500 people, these figures suggest that each clinic sees between 15 and 55 clients a day. It should be noted that many clients present with multiple health problems because of the high rates of illness in these communities.

Aboriginal health workers and primary health care

In most parts of Australia, the range of work that Aboriginal health workers do in remote areas of the NT would be undertaken by several specialist practitioners (see inset).

Because of the demands for ‘sickness care’ in remote communities, Aboriginal health workers have limited opportunities to undertake health education and promotion in their communities.

Doing it all: Aboriginal health workers as receptionist, doctor, nurse, pharmacist and laboratory staff

Two-year-old Peter is brought to his local remote area health centre by his mother. They wait on a bench in the main clinic while Margaret, the senior Aboriginal health worker, retrieves his file from the filing cabinet (*receptionist*).

Peter’s mother tells Margaret he has been unwell with diarrhoea and fever for one day. Margaret examines Peter (*doctor*) including weighing him, checking his haemoglobin with a portable machine and testing his urine after obtaining a urine specimen by using a urine bag (*nurse*). Margaret checks the CARPA guideline, but decides to telephone the doctor on call for further advice. The doctor advises fluid replacement, antibiotics for a skin infection, and iron replacement and worm medicine for anaemia, and requests a faecal specimen for further testing.

Margaret makes up the fluid replacement solution and administers a penicillin injection (*nurse*), then goes to the clinic pharmacy and selects and labels the iron medicine and worm medicine (*pharmacist*). She then explains the doses of the medicine to Peter’s mother (*doctor*), giving her a labelled specimen jar for the faecal specimen.

Margaret must also transfer the urine specimen into a container, write the appropriate pathology forms, and store the specimens in the fridge (*pathology laboratory staff*). Finally, she will record Peter’s name in the clinic diary for daily review over the next few days, and arrange for the clinic driver to take him and his mother home (*receptionist*).

Note: The CARPA guidelines, developed by the Central Australian Remote Practitioners Association, provide advice on the management of common health problems—they are used in all health clinics in NT remote areas

Source: Darwin Rural Services, THS

Remote health centre staff readily acknowledge the limitations of this ‘sickness care’ approach, but attempts to change are often frustrated because of the high level of clinical need. A report on Aboriginal health workers in the NT noted that Aboriginal health workers recognise the need for them to work outside the clinical setting (Tregenza & Abbott 1995): *The overwhelming number of health workers in Central Australia stated that they wanted to get out of the clinic more and tackle health issues in the community.*

Primary health care programs

All clinics provide some level of primary health care programs, with visiting staff providing support for planning, training or extra staff for screening. Examples of the types of primary health programs are:

- well baby clinic—immunisation for children, and growth monitoring of children under five years
- antenatal clinic
- monthly penicillin injections to prevent recurrence in people who have had rheumatic fever
- support for the frail elderly and disabled, including regular home visits and check-ups
- supervised treatment of TB cases and screening of contacts
- diabetes reviews
- Well Women's screening—Pap smears, screening for STDs and chronic diseases

Men's clinics for men's business

In the late 1990s men's clinics were developed in some remote NT communities as a way of encouraging men to use health services. Historically, most health staff—both Aboriginal health workers and remote area nurses—have been female. Much of Aboriginal society is still divided into men's business and women's business, and health clinics have been seen as women's places. Providing better services to men requires increased numbers of male health personnel as well as separate men's clinics. Experience has shown that the numbers of men accessing regular health care increased in a community once it had a men's clinic (Guyula 1998).

Air medical services

The vast distances and poor road surfaces in remote areas of the NT, particularly in the wet season, mean that air transport is often the only practical means of travel for people requiring hospital treatment. A 1996 study found that 25% of NT hospital inpatients resided between 201 and 2,000 km from their admitting hospital and that it was about twice as expensive to treat patients from remote areas as those from urban areas (Beaver & others 1997).

There are two main air medical services in the NT:

- Northern Territory Aerial Medical Service (NTAMS), which covers the Top End
- Royal Flying Doctor Service (RFDS), which covers Central Australia

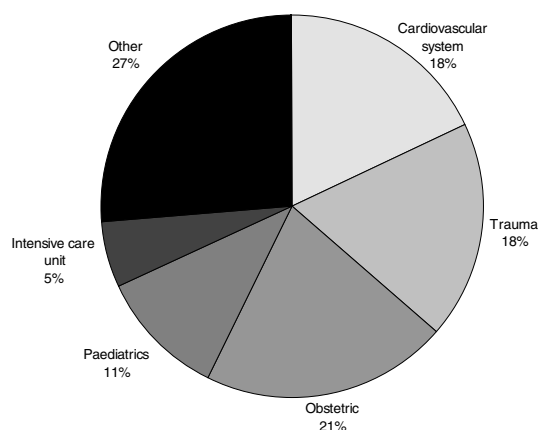
Also, in Tennant Creek, THS charters an unpressurised aircraft that mostly performs inter-hospital transfers to Alice Springs. RFDS provides support to Tennant Creek for complicated transfers.

Emergency evacuations

District medical officers provide remote area clinic staff with a 24-hour medical consultation service and coordinate the evacuation of patients in emergencies. Patients are accompanied on air medical flights by a flight nurse.

The evacuation of patients is linked with the primary health care service, mainly through the district medical officers; they visit remote communities regularly and are usually accompanied by flight nurses, both of whom provide clinical and professional support to remote area clinic staff.

15.6 Top End urgent air medical evacuations 1997

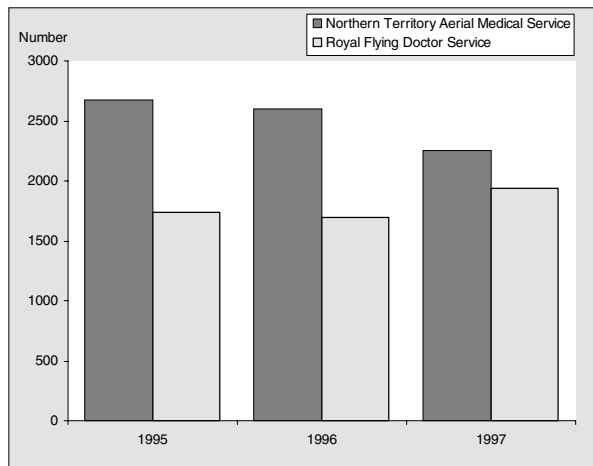


Notes: Clinical categories of NTAMS priority one flights (Darwin base) in 1997
 'Cardiovascular system' includes heart attacks and heart failure
 'Trauma' means injuries
 'Intensive care unit' includes severe infections and unconscious patients
 'Other' includes medical conditions such as chronic obstructive airways disease and pneumonia

Data: Darwin Rural Services, THS

In 1997, the largest single group of priority one flights in the Top End was obstetrics (graph 15.6), mainly women close to full term in labour (37 weeks or more), in premature labour or experiencing other complications of pregnancy. The next two largest groups of urgent air medical evacuations were people with cardiovascular disease and trauma, which is consistent with the leading causes of death for NT Aboriginal people.

15.7 NT emergency medical evacuations 1995 to 1997



Notes: Royal Flying Doctor Service is for financial years 1995–96 to 1997–98
NT Aerial Medical Service is for calendar years 1995 to 1997

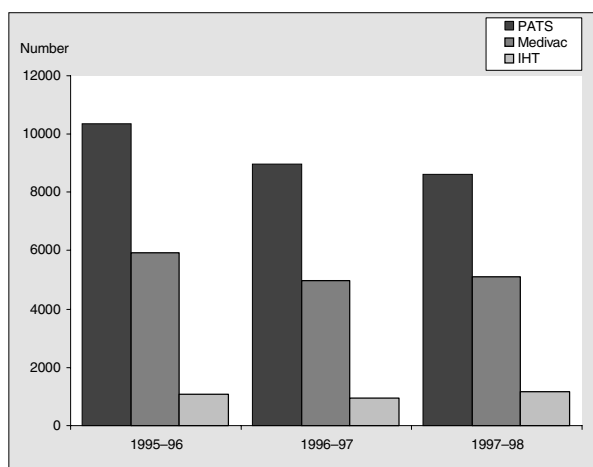
Source: Darwin Rural Services, THS

In the three years to 1997, there was a decreasing trend in the number of NT emergency medical evacuations in the Top End and an increasing trend in Central Australia (graph 15.7). Reasons for these trends have not been fully studied, but unpublished data from the NTAMS Darwin base indicate that the two main diagnostic categories which decreased were childhood diarrhoea and trauma.

Patient travel

The Patient Assistance Travel Scheme (PATS), medivacs and inter-hospital transfers are the three main methods used to transport NT people for medical reasons. PATS provides financial assistance for

15.8 NT patient travel



Notes: 'PATS' means Patient Assistance Travel Scheme
'Medivac' means emergency patient evacuations
'IHT' means inter-hospital transfers

Source: THS 1998

outpatients to access specialist care in the major urban areas; a small proportion of PATS travel relates to NT residents who travel interstate, on regular passenger aircraft, to access specialist services that are not available in the NT. Medivacs and most inter-hospital transfers relate to the transport of patients in emergencies.

Between 1995–96 and 1997–98, the number of patients who accessed PATS decreased (graph 15.8). This was associated with increased numbers of specialists travelling to remote areas of the NT.

Coordinated care trials

Coordinated care trials are a Council of Australian Governments (COAG) response to the need to improve the health outcomes for people with complex or chronic illnesses while containing the cost of their health care. Since the late 1990s, the NT has been participating in two coordinated care trials: one on the Tiwi Islands, near Darwin; and the other in a group of remote communities west of Katherine. The outcomes of the NT trials will influence the development of funding models for Aboriginal community health.

Key features of each of the NT coordinated care trials are coordination of care for all of the people who live in a community, and the creation of:

- an incorporated health board that represents the community's health interests, holds funds and purchases health care to meet the needs of community members
- a flexible funding pool consisting of all Territory and Commonwealth health funding that would otherwise have been directed to the community

Coordinating care for the whole community

Care coordination involves both the development of care plans for individuals and the coordination of health services provided in communities. Because the NT trials aim to improve health outcomes for all members of each community, they focus on prevention and education strategies that address health matters such as smoking, hygiene, nutrition and alcohol. Both NT coordinated care trials aim to reduce patient travel costs by facilitating community-based health services instead of patients having to travel to urban areas such as Katherine and Darwin.

Area health boards

The creation of area health boards enables communities to participate in the planning, management and delivery of health care so that they receive health services which best suit their needs. Each health board manages their flexible funding pool (see below) and decides how to provide the health services they need, either by:

- recruiting staff and/or setting up facilities to provide their own health services
- purchasing specialist health services from THS or private health service providers

Flexible funding pool

For each of the two NT coordinated care trials, the funds that were historically spent on health services for the people in those communities were identified and contributed to a pool. That pool includes funding for community health centres, primary medical care, public health, health promotion, allied health, patient travel and health services management. In addition, the Commonwealth contributed Medicare (MBS) and Pharmaceutical Benefits Scheme (PBS) funds based on national per capita utilisation rates for these schemes. The additional MBS and PBS funds has meant the Tiwi trial received 30% more funding than was previously available for primary health care; and the Katherine West trial 70% extra funding.

References

ABS 1997, *Australian Demographic Statistics*, cat no 3101.0, ABS, Canberra.

Bartlett B, Duncan P, Alexander D & Hardwick J 1997 *Central Australian Health Planning Study: Final Report*, PlanHealth, Coledale (NSW).

Beaver C, van Konkelenberg R, Baines D & others 1997, 'Does the national average apply in the Northern Territory?', *Ninth Casemix Conference in Australia*, H&FS, Canberra.

Declaration of Alma-Ata web site:
<http://www.who.dk/policy/almaata.htm>

Guyula T 1998, 'The Gapuwiyak Men's Clinic', *Aboriginal and Islander Health Worker Journal*, vol 22, no 3.

Kennedy K 1998, *Urban Communities of the Northern Territory: a Profile*, Primary Health & Coordinated Care Branch THS, 1998

Kettle ES 1991, *Health Services in the Northern Territory: a History 1824–1970*, 2 vols, ANU NARU, Darwin.

National Aboriginal Health Strategy Working Party 1989, *A National Aboriginal Health Strategy*, National Aboriginal Health Strategy Working Party, Canberra.

Thomas DP 1995, Clinical consultations at an Aboriginal community-controlled health service: how are they different to consultations with Australian general practice?, MMedSc thesis, University of Newcastle.

THS 1998, *THS Annual Report 1997–98*, NTGP, Darwin.

Todd R 1996, General practice evaluation, MAE thesis, NCEPHANU.

Tregenza JD & Abbott K 1995, *Rhetoric and Reality: Perceptions of the roles of Aboriginal Health Workers in Central Australia*, CAAC, Alice Springs.

Hospital services

by John Condon and Allison Grierson

This chapter summarises the development of hospitals and specialist services in the NT, followed by an analysis of hospital workload in recent years.

The development of hospital services in the NT

The establishment of civilian hospitals and health services in the NT was sporadic, largely because of the Territory's geographical isolation. The presence of Australian and United States troops during World War II aided the advancement of health services in the Territory.

Hospitals

The NT's first hospital was established at Doctor's Gully in Palmerston (later named Darwin after the port of the same name) in 1874. In 1942, an 89-bed hospital was opened on the site of the former Kahlin Aboriginal Reserve and bombed 17 days later. Together with its many 'temporary' prefabricated wards, this hospital was extensively damaged by Cyclone Tracy in 1973. It was eventually replaced in 1980 by a multistorey building that is now known as Royal Darwin Hospital (Kettle 1986).

Alice Springs Hospital was established as a military hospital on its current site in 1939. A number of services were improved and expanded when new buildings were added in the late 1950s (adult general ward) and early 1960s (including an operating theatre and maternity unit with nursery). The present hospital building was opened in early 1977.

By the early 1970s, there was a public hospital in each of the NT's five urban centres—Darwin, Katherine, Tennant Creek, Alice Springs and Nhulunbuy—and, since 1987, one private hospital in Darwin. Together, these hospitals provided 721 beds in 1999 (table 16.1).

Royal Darwin Hospital is the Territory's principal acute care and specialist referral hospital, offering a wide range of specialist medical and support services.

16.1 NT hospital beds 1999

	Beds
Top End	
Royal Darwin Hospital	297
Katherine Hospital	60
Gove District Hospital	30
Darwin Private Hospital	150
Central Australia	
Alice Springs Hospital	164
Tennant Creek Hospital	20

Data: Acute & Specialist Care Branch, THS

Visiting specialists provide some specialist services such as outpatient consultations and minor surgery at the Top End's two district hospitals, Katherine Hospital and Gove District Hospital, and in larger remote communities. People with more serious illnesses are referred to Royal Darwin Hospital.

Alice Springs Hospital is the principal acute care and specialist referral hospital for Central Australia. It also services the northern part of South Australia and several communities in Western Australia along the NT border. Tennant Creek Hospital is the only other hospital in Central Australia.

Tennant Creek and Gove District Hospitals serve a dual role in that doctors based in these hospitals also provide primary health care services in Aboriginal communities and cattle stations in the surrounding districts.

Specialist services

Until the late 1970s, specialist services at Darwin Hospital were limited to surgery and anaesthetics, general medicine, obstetrics and gynaecology, paediatrics, psychiatry, pathology and radiology (see inset over). By 1980, there was also an orthopaedic surgeon, dermatologist, ophthalmologist and ear, nose and throat specialist. Other services were provided by visiting medical specialists (such as cardiologists and renal physicians), mostly from Adelaide, or specialist doctors who moved to Darwin for short

The first medical specialists at Darwin Hospital

Specialist doctors were steadily appointed to Darwin, the first being a surgeon, Gordon Birks in 1949. He also did the surgery at Katherine, Tennant Creek and Alice Springs on a monthly basis and was flown to these hospitals for major emergencies. Darwin hospital was seldom without a surgeon. Other categories took longer. Dr RHC Wells, the Medical Superintendent in 1961, was the first physician and it was he who had the medical records filed by numbers. Dr CM McLean came as the first ophthalmologist in 1958 and did much work on the eye disease trachoma. Gynaecology was the next with the appointment of Dr ST James who has remained in Darwin. Dr GO Cowdy was the first qualified psychiatrist in May 1966 and Dr Alan C Walker the first paediatrician in September 1967. The two armed services doctors moved into private practice in 1955 and paved the way for the considerable number of private doctors practicing in Darwin now.

from A brief history of Royal Darwin Hospital by Ellen Kettle, 1986.

periods. Royal Darwin Hospital appointed its first specialist in emergency medicine and a rehabilitation physician in 1994, a specialist heart physician in 1997 and a specialist intensive care physician in 1998.

The first resident medical specialists arrived at Alice Springs Hospital during the 1970s. By 1999, Alice Springs Hospital employed specialists in medicine, surgery, anaesthetics, paediatrics, obstetrics and gynaecology, psychiatry, renal medicine, orthopaedics, rehabilitation, ear, nose and throat surgery and ophthalmology. Other specialist services are provided by visiting specialists from either Adelaide or Darwin.

The Territory's first kidney (renal) dialysis unit was established at Royal Darwin Hospital in 1980. Initially treating only four patients, the unit was able to treat 100 dialysis patients by 1996 when a full-time renal physician was appointed. Alice Springs' kidney dialysis unit was established in 1987. By June 1999, it was treating 70 patients. A dialysis unit opened at Nguiu on Bathurst Island in 1999, and another in Katherine in 2000.

Palliative care nursing services were available in Darwin from the late 1980s, and multidisciplinary palliative care teams were established in the Top End

and Central Australia after the 1995 passage of the *NT Rights of the Terminally Ill Act* (later overturned).

The development of specialist services in the Top End was assisted by the establishment of the Menzies School of Health Research in 1985 and the NT Clinical School at Royal Darwin Hospital in 1996. The NT Clinical School is run jointly with Flinders University Medical School. Alice Springs Hospital joined the NT Clinical School in 1999.

Hospital usage

Details of the numbers of inpatients treated in NT hospitals indicate changing patterns of hospital usage, differences in the extent to which particular groups of Territorians spend time in hospital and the kinds of diseases that most often put people into hospital.

Until recently, NT hospital information systems provided limited data about outpatient services and other services provided by hospital staff such as specialists' visits to remote communities. Data from the Darwin Private Hospital are not currently available.

The hospital activity statistics (see inset below) presented in this chapter do not include:

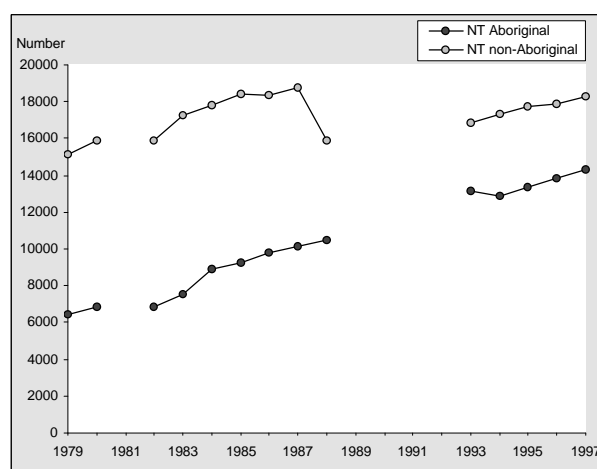
- residents of other States who were treated in NT hospitals
- well people (termed 'boarders') who are admitted to hospital to accompany a relative who is being treated, mostly mothers with a sick child or young children with a sick mother
- same-day kidney dialysis patients

NT public hospital inpatient data

Data on hospital inpatient services in each of the NT's five public hospitals have been recorded in the NT hospital morbidity dataset since 1976. The NT hospital morbidity dataset contains a summary record of each episode of inpatient care. It contains demographic data about each inpatient, including their age, sex, place of residence and indigenous status, and data about their treatment, including the number of days they spent in hospital (length of stay), the main condition treated (principle diagnosis) and other conditions treated (comorbidities). Each episode of inpatient care is termed a 'hospital separation' because the summary record is compiled at the time the patient leaves hospital.

Changing patterns of hospital usage

16.2 All NT public hospital separations



Notes: Excludes interstate residents, boarders and same-day kidney dialysis patients
Data for 1981 and 1989–92 are not available

Data: Epidemiology Branch, THS

From 1979 to 1997, total annual NT public hospital separations (admissions) increased 59%, from 21,588 to 32,711: 26% for non-Aboriginal Territorians and 51% for Aboriginal Territorians. In 1988, following the opening of Darwin Private Hospital in 1987, the number of non-Aboriginal people treated in NT public hospitals (mainly Royal Darwin Hospital) dropped by 16% (graph 16.2).

Over the years 1993 to 1997, total NT public hospital separations increased by similar amounts for both Aboriginal and non-Aboriginal people (9%) (table 16.3), which was slightly less than the increase in the NT population (11%) over this period.

The increasing inpatient workload has not been evenly distributed across all public hospitals. While the number of separations from the three largest hospitals increased between 1993 and 1997—Royal Darwin Hospital by 15%, Alice Springs Hospital by 7% and Katherine Hospital by 9%—the workload at Tennant Creek Hospital and Gove District Hospital fell. Tennant Creek Hospital's 28% fall in the number of non-Aboriginal separations is explained partly by a decrease in the non-Aboriginal population of the surrounding area. The non-Aboriginal population of the Barkly district decreased by 11% between 1991 and 1996 (ABS 1998).

16.3 NT public hospital separations

	Separations		Change (%) 1993 to 1997
	1993	1997	
Royal Darwin Hospital			
Aboriginal	4,119	4,956	20.3
Non-Aboriginal	10,314	11,564	12.1
Total	14,433	16,541	14.6
Alice Springs Hospital			
Aboriginal	4,477	4,753	6.2
Non-Aboriginal	3,836	4,118	7.4
Total	8,313	8,878	6.8
Katherine District Hospital			
Aboriginal	1,989	2,227	12.0
Non-Aboriginal	1,541	1,624	5.4
Total	3,530	3,852	9.1
Gove District Hospital			
Aboriginal	1,504	1,347	-10.4
Non-Aboriginal	573	600	4.7
Total	2,077	1,947	-6.3
Tennant Creek Hospital			
Aboriginal	1,044	1,072	2.7
Non-Aboriginal	582	419	-28.0
Total	1,626	1,493	-8.2
Total			
Aboriginal	13,133	14,355	9.3
Non-Aboriginal	16,846	18,325	8.8
Total	29,979	32,711 *	9.1

Notes: Excludes interstate residents, boarders and same-day kidney dialysis patients

* includes 31 separations (admissions) for which indigenous status was not recorded

Data: Epidemiology Branch, THS

Length of stay

Hospital inpatient treatment is the most expensive form of health care. The steadily rising demand for and costs of acute inpatient care have forced governments and health care managers to seek more efficient ways to maintain the high standard of acute care that Australians have enjoyed over recent decades. This has partly been achieved by reducing the length of time people remain in hospital in the following ways:

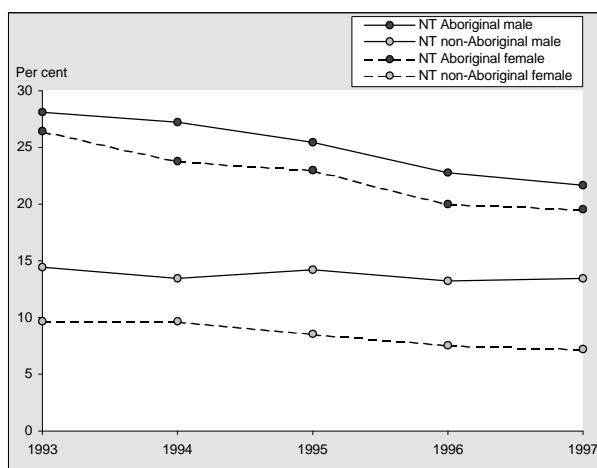
- introducing more same-day surgical procedures
- discharging people who no longer need intensive nursing care to a 'self-care' unit where they take care of most of their own needs while still receiving regular medical treatment

- greater use of community nursing and other services in people's own homes, thereby enabling patients to return home earlier than would have been the case previously

In recent years in the NT, the average length of stay (the number of days a patient is in hospital each time they are hospitalised) has decreased as these changes have occurred.

The number and complexity of procedures that allow patients to return home on the same day has increased significantly, largely due to improvements in technology that enable patients to recover quickly and resume their normal activities within a short period of time. In the NT, the proportion of patients treated as same-day patients is much higher for non-Aboriginal than Aboriginal people, possibly because a high proportion of Aboriginal people require treatment for multiple health problems when admitted to hospital.

16.4 NT patients in hospital more than seven days

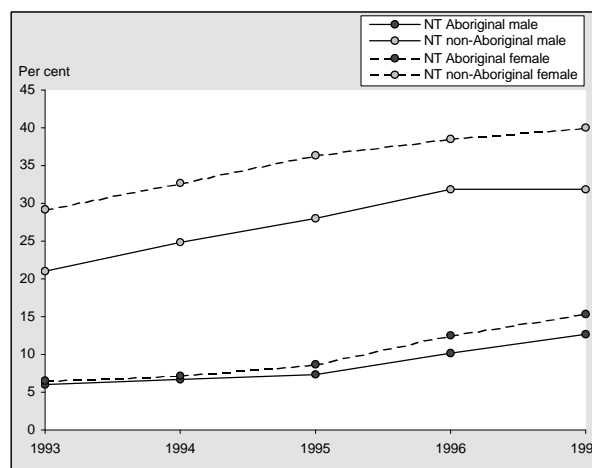


Notes: Number of separations (admissions) with a length of stay of more than seven days as a percentage of total separations
Excludes interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

The average time spent in NT public hospitals by Aboriginal patients is longer than that for non-Aboriginal patients: in 1993, over 25% of Aboriginal patients spent more than seven days in hospital compared with only 10% of non-Aboriginal female and 15% of non-Aboriginal male patients (graph 16.4). Because a high proportion of female patients are in hospital for childbirth, which usually requires only a few days in hospital, the proportion of female patients with long stays in hospital is less than that of males. The proportion of Aboriginal people who stayed in NT public hospitals for more than seven days fell considerably between 1993 and 1997.

16.5 NT same-day patients



Notes: Number of same-day separations (admissions) as a percentage of total separations
NT public hospitals, excluding interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

In the NT, between 1993 and 1997, the number of same-day patients increased for Aboriginal and non-Aboriginal patients of both sexes (graph 16.5). Over this period, the number of same-day NT public hospital separations rose by:

- 72% for non-Aboriginal males and 48% for non-Aboriginal females
- 124% for Aboriginal males and 157% for Aboriginal females, but this increase was from a very low base

Aboriginal people

16.6 NT Aboriginal hospital separations 1997

	Total		Aboriginal	
	No.	% (a)	No.	% (b)
Royal Darwin	16,541	50.6	4,956	30.0
Alice Springs	8,878	27.1	4,753	53.5
Katherine	3,852	11.8	2,227	57.8
Gove	1,947	6.0	1,347	69.2
Tennant Creek	1,493	4.6	1,072	71.8
Total NT	32,711	100.0	14,355	43.9

Notes: Excludes interstate residents, boarders and same-day kidney dialysis patients
(a) proportion of total NT separations (admissions)
(b) proportion of each hospital's separations that are of Aboriginal people

Source: Epidemiology Branch, THS

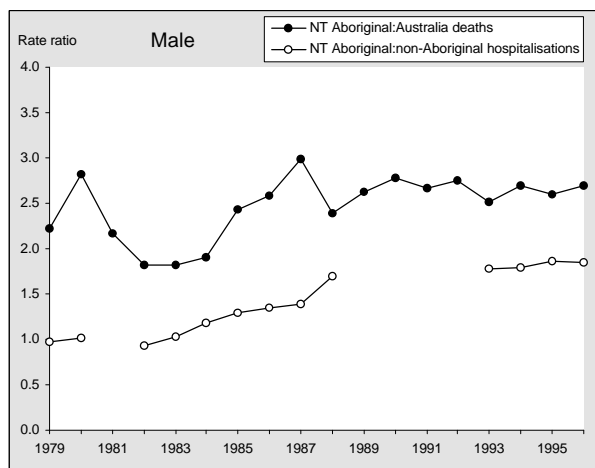
In 1997, Royal Darwin Hospital treated over half of all NT public hospital inpatients, while Alice Springs Hospital treated over one quarter (table 16.6). In all NT hospitals except Royal Darwin, Aboriginal people

comprised over half of all hospital separations; at the Gove and Tennant Creek hospitals, they comprised over two-thirds. This reflects the severe health problems of Aboriginal people throughout the NT and the high proportion of Aboriginal Territorians who live outside of Darwin.

Need for hospital care

NT Aboriginal people require a greater level of health services because of their worse health status. There is no way to measure exactly the level of hospital services that NT Aboriginal people need, but one indication of their greater need for health services is the extent to which the death rate of Aboriginal people exceeds that of other Australians (the death rate ratio).

16.7 Male death and hospitalisation rate ratios



Notes: NT Aboriginal:Australia age-adjusted death rate ratio
 NT Aboriginal:NT non-Aboriginal age-adjusted public hospital separation (admission) rate ratio (excludes interstate residents, boarders and same-day kidney dialysis patients) data for 1981 and 1989–92 are not available

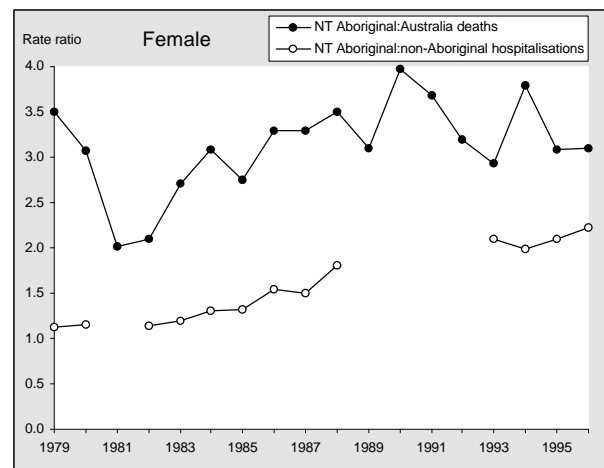
Data: Deaths—Dempsey & Condon 1999
 Hospital separations—Epidemiology Branch, THS

In 1979, NT hospitalisation rates were slightly less for Aboriginal males than for non-Aboriginal males and only 10% higher for Aboriginal females than for non-Aboriginal females (graphs 16.7 and 16.8). NT Aboriginal hospitalisation rates rose steadily over the next 17 years.

In 1996:

- NT Aboriginal males used public hospitals at 1.8 times the rate of NT non-Aboriginal males but died at three times the rate of Australian males
- NT Aboriginal females used public hospitals at 2.2 times the rate of NT non-Aboriginal females but died at 3.1 times the rate of Australian females

16.8 Female death and hospitalisation rate ratios



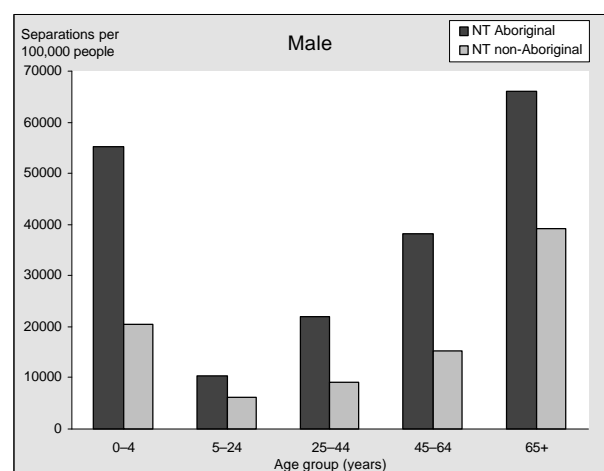
Notes: NT Aboriginal:Australia age-adjusted death rate ratio
 NT Aboriginal:NT non-Aboriginal age-adjusted public hospital separation (admission) rate ratio (excludes interstate residents, boarders and same-day kidney dialysis patients) data for 1981 and 1989–92 are not available

Data: Deaths—Dempsey & Condon 1999
 Hospital separations—Epidemiology Branch, THS

Given that the higher death rates of NT Aboriginal people indicate their greater need for health services, the rates at which they used hospital services still lagged behind in 1996. Although NT Aboriginal public hospital separation rates increased considerably during the previous two decades, the great disparity between the death rates of NT Aboriginal people and Australians generally indicates that NT Aboriginal hospitalisation rates will continue to rise.

Men and women

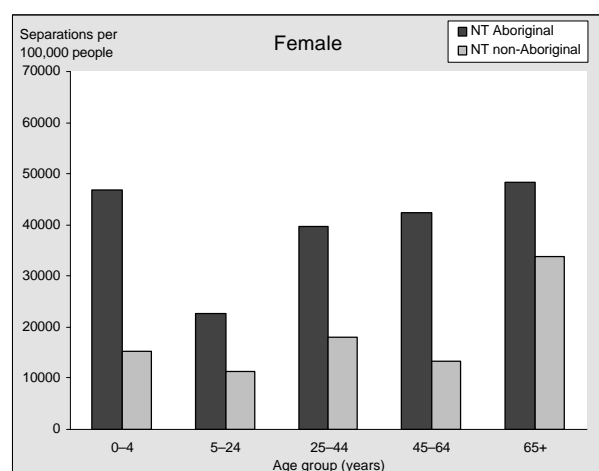
16.9 NT male hospital separations 1993 to 1997



Notes: Age-specific hospital separation rates per 100,000 people
 Excludes interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

16.10 NT female hospital separations 1993 to 1997



Notes: Age-specific hospital separation rates per 100,000 people
Excludes interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

Generally, hospitalisation rates are very high at the beginning and end of life, as was the case in the NT between 1993 and 1997 when hospitalisation rates for both males and females were (graphs 16.9 and 16.10):

- high for children aged under five
- higher in those aged 65 and over than in any other age group

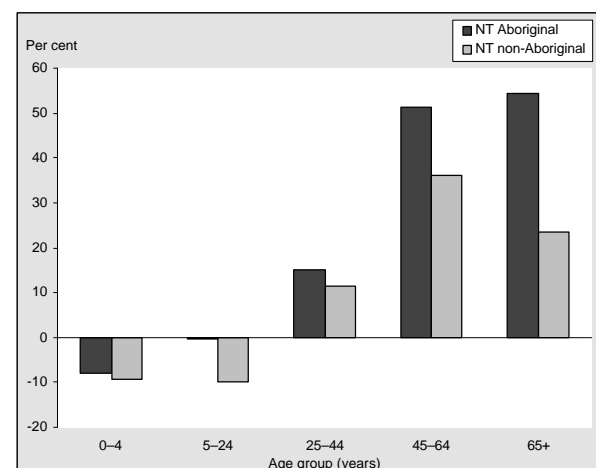
Between these ages, males and females have quite different patterns of hospitalisation: males make very little use of hospital services in their teenage and early adult years, but females have a more consistent rate of hospital use across all age groups.

Between 1993 and 1997, NT male hospitalisation rates were high in early childhood (under five years), very low between five and 24 years, then rose progressively with increasing age. This pattern was the same for both Aboriginal and non-Aboriginal males, even though hospital separation rates for NT Aboriginal males were approximately twice that of NT non-Aboriginal males in all age groups.

The pattern of hospitalisation for NT females was quite different from that of NT males. Between 1993 and 1997, NT female hospital separation rates were lower than males in young children (aged 0–4) and older people (aged 65 and over) but considerably higher between the ages of five and 24 years and again between 25 and 45 years. The higher female rates in the early adult years are largely due to childbirth and gynaecological conditions. Hospitalisation rates for NT Aboriginal females were two to three times higher than those of non-Aboriginal females in most age groups.

Age

16.11 Changes in NT hospital usage by age 1993 to 1997



Notes: Percentage change in the number of NT public hospital separations (admissions) between 1993 and 1997
Excludes interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

The numbers of young people using NT hospitals fell between 1993 and 1997, at the same time as the hospitalisation of older people increased (graph 16.11 and table 16.12). Between 1993 and 1997 the number of separations of young people decreased by 8% for those aged 0–4, and by 5% for those aged 5–24, while the population in these age groups increased by 6%. The fall in the number of hospital separations of Aboriginal children under five was entirely due to their decreased hospitalisation for intestinal infections (see table 16.14).

Most of the increased hospitalisation (13%) of those aged 25 to 44 can be attributed to their population increase (9%) over the period. In the older age groups, the number of hospital separations increased considerably—by 41% for those aged 45 to 64 and by 31% for those aged 65 and over. The increase was greater for Aboriginal than non-Aboriginal people. For non-Aboriginal people, most of the increase can be attributed to their population increase over this period (24%). For Aboriginal people, the increase was much greater than the level of population increase (15%), and is probably partly due to the rising levels of chronic diseases in Aboriginal adults. It is also likely that the improvements in primary health care services which have occurred in recent years (such as the presence of general practitioners in larger remote communities) have led to increased detection and referral to hospital of people with chronic diseases who were previously undiagnosed and untreated.

16.12 Changes in NT hospital usage by age 1993 to 1997

	Separations		Change (%)
	1993	1997	1993 to 1997
0–4 years			
Aboriginal	3,762	3,459	-8.1
Non-Aboriginal	2,229	2,019	-9.4
Total	5,991	5,487	-8.4
5–24 years			
Aboriginal	3,567	3,557	-0.3
Non-Aboriginal	4,030	3,631	-9.9
Total	7,597	7,193	-5.3
25–44 years			
Aboriginal	4,004	4,605	15.0
Non-Aboriginal	6,299	7,023	11.5
Total	10,303	11,640	13.0
45–64 years			
Aboriginal	1,342	2,029	51.2
Non-Aboriginal	2,826	3,850	36.2
Total	4,168	5,883	41.1
65+ years			
Aboriginal	440	679	54.3
Non-Aboriginal	1,459	1,801	23.4
Total	1,899	2,481	30.6

Notes: Number of NT public hospital separations (admissions) and percentage change between 1993 and 1997
Excludes interstate residents, boarders and same-day kidney dialysis patients
'Total' includes some separations for which Indigenous status was not recorded

Source: Epidemiology Branch, THS

Older people generally have more complex, chronic illnesses than younger people, are more prone to developing complications and slower to recover, and thus consume more resources when they are hospitalised. An increase in the hospital separations of older people consumes more resources than are saved by a similar-sized decrease in hospital separations of younger people.

Major diseases

Among the most common causes of death and hospitalisation in the NT are circulatory, respiratory and infectious diseases, injury, cancer and endocrine diseases (particularly diabetes).

Between 1993 and 1997, public hospital separations for NT Aboriginal people (table 16.13):

- decreased for communicable diseases, entirely due to a fall of almost 50% in the number of

16.13 Changes in NT hospital usage for major diseases

	Separations		Change (%)
	1993	1997	1993 to 1997
NT Aboriginal			
Infectious	1,174	855	-27.2
Cancer	152	214	40.8
Endocrine	305	631	106.9
Circulatory	462	607	31.4
Respiratory	1,792	2,258	26.0
Injury	1,819	1,864	2.5
All causes	13,131	14,338	9.2
NT non-Aboriginal			
Infectious	429	416	-3.0
Cancer	590	706	19.7
Endocrine	162	262	61.7
Circulatory	858	958	11.7
Respiratory	1,438	1,283	-10.8
Injury	2,107	2,041	-3.1
All causes	16,846	18,316	8.7

Notes: Number of NT public hospital separations (admissions) and percentage change between 1993 and 1997
Excludes interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

separations for intestinal infections in children aged 0–4 years (see table 16.14)

- remained almost unchanged for injury
- increased considerably for the chronic diseases of cancer, endocrine disease, circulatory disease and respiratory disease

Over the same period, NT public hospital separations for NT non-Aboriginal people:

- decreased for respiratory diseases
- remained almost unchanged for communicable diseases and injury
- increased for the chronic diseases of cancer, endocrine disease and circulatory disease

Chronic diseases predominantly affect older people. For non-Aboriginal people, the increase in the number of separations for chronic diseases (except endocrine diseases) was less than the increase (24%) in the number of people aged 45 years and over. For Aboriginal people, however, population increase (15% for those aged 45 and over) explains only a small part of the increase in hospital separations for chronic diseases.

16.14 NT children aged under five: hospital separations for intestinal infections

	Year		Change	
	1993	1997	No.	%
No. of separations				
NT Aboriginal	781	410	-371	-47.5
NT non-Aboriginal	98	92	-6	-6.1
Total NT	879	502	-377	-42.9
Rate				
NT Aboriginal	877	445		-49.2
NT non-Aboriginal	70	60		-13.2

Notes: Number of NT public hospital separations (admissions) and percentage change between 1993 and 1997
Age-specific rate per 100,000 people, and percentage increase NT public hospitals, excluding interstate residents, boarders and same-day kidney dialysis patients

Source: Epidemiology Branch, THS

References

ABS 1998, *1996 Census of Population and Housing: Aboriginal and Torres Strait Islander People, Northern Territory*, cat no 2034.7, Canberra.

Kettle ES 1986, A brief history of Royal Darwin Hospital, unpublished manuscript in possession of Central Library, THS, Darwin.

Markey PG, d'Espaignet ET, Condon JR & Woods M 1998, *Trends in the Health of Mothers and Babies, Northern Territory, 1986-95*, THS, Darwin.

THS 1998, *Territory Health Services Annual Report 1997-98*, NTGP, Darwin.

THS hospitals web site:

<http://www.nt.gov.au/nths/#hospitals>

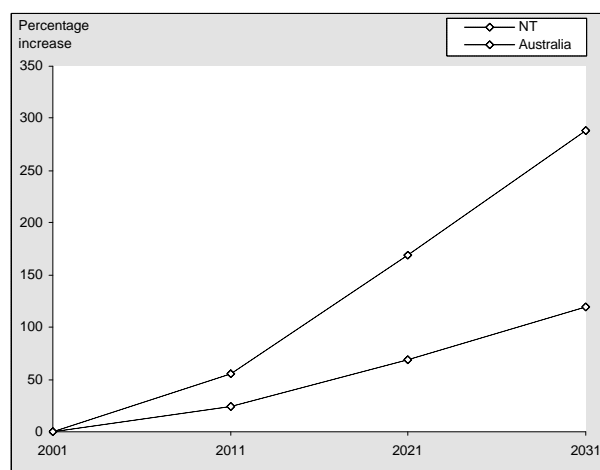
Aged care and disability services

by Damien Conley, Judy Barnes and Rosanne Lague (aged care), Kerry O'Brien and Ali Nur (disability)

Aged care

The Northern Territory has a relatively younger population than the rest of Australia. In 1997, the average age of Territorians was 28 years, compared with the national average of 34 years (ABS 1998a). In 1997, 3.3% (6,125 people) of the total NT population was aged 65 years and over, compared to 12% of the national population (ABS 1998b).

17.1 Our ageing population



Note: Projected increase in the number of people aged 65 years or more

Data: ABS 1998a

Aged people represent a significantly smaller percentage of the NT population than nationally, but the number of aged people is growing faster in the NT than in Australia as a whole. By 2031 the number of Australians aged 65 and over is expected to increase by just over 100%, while in the NT the number of people in this age group is expected to increase by almost 300% (graph 17.1). The NT aged population is projected to rise to 10,400 people (4.2% of the NT population) by 2011, and to 26,000 people (7.7%) by 2031, assuming a stable rate of interstate migration (ABS 1998a).

The increase in the number of aged Territorians will increase the demand for care services, both residential and community-based. However, several distinctive features of the NT have a considerable influence on the delivery of aged care services. In comparison to Australia as a whole, the NT has:

- a much higher proportion of Aboriginal people (28% versus 2% nationally) (ABS 1998b)
- a higher proportion of people who speak a first language other than English (21% versus 14% nationally) (ABS 1997a, ABS 1997b)
- a higher proportion of people who live in rural and remote areas (27% versus 14% nationally, 12% in NSW and Victoria) (ABS 1996). A large proportion of these rural and remote residents are Aboriginal people
- a higher proportion of younger people in high level residential care facilities (previously called nursing homes)—in 1994, 9% of residents in nursing homes were under 50 years old and 19% were aged 50-69, compared to 1% and 8% nationally (Mathur 1996). A large proportion of these younger people were Aboriginal
- a significantly higher proportion of Aboriginal people in high level residential care facilities. In 1994, 42% of NT people in high level residential care were Aboriginal, compared to 1% nationally (Mathur 1996). However, this still represents relative under-servicing of Aboriginal people, who comprise 50% of the target population in the NT
- a significantly higher proportion of younger people with disabilities accessing Home and Community Care (HACC) services. In 1994, 26% of people accessing HACC services in the NT were under 65, compared with 14% nationally (HSH 1994)
- a significantly higher proportion of concessional residents in aged care facilities. In 1997, 95% of aged care residents in the NT were concessional residents, compared to 26% nationally (Aged Care Branch THS, unpublished), and this is high in both the Aboriginal and non-Aboriginal populations
- a serious shortage of housing in remote areas. In 1996, less than one percent of Australian households in rural and remote areas lived in improvised dwellings, compared to twelve percent in rural and remote areas of the NT. Less than 1% of non-Aboriginal households (both in the NT and nationally) consisted of eight or more people, compared to 17% of Aboriginal households nationally and 22% in the NT (ABS 1997c, ABS 1998c)

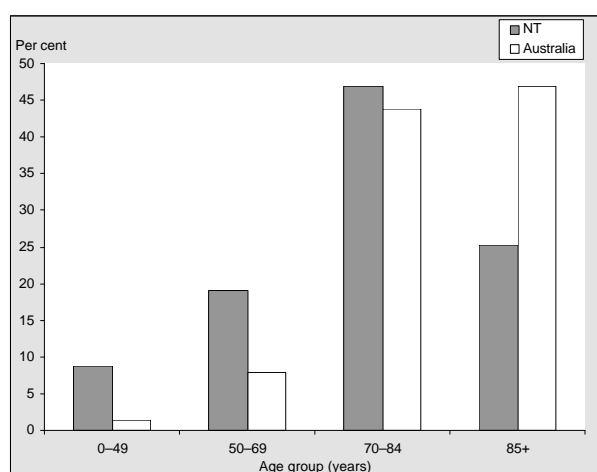
Residential aged care

In the NT, residential aged care is provided through either nursing homes or hostels. These services provide accommodation, care and support to frail aged people.

The Residential Aged Care Program, although the responsibility of the Commonwealth Government, also receives substantial funding from the NT Government to improve the viability and quality of residential care services. Commonwealth funding is allocated according to the number of aged people in each state on the basis of a 'planning ratio' of 100 care places per 1,000 people aged over 70 years. These 100 places are made up of 40 high care places (nursing homes), 50 low care places (hostels) and 10 community care package places.

Aboriginal Australians suffer high levels of chronic disease and disability at much younger ages than other Australians. The Commonwealth Government has acknowledged that Aboriginal people have a degree of 'premature ageing' (based on death and disease rates and utilisation of care services), and therefore need to access aged care services at an earlier age (see the Causes of death and Hospital services chapters). The planning ratio throughout Australia includes Aboriginal people aged 50 years and over. Therefore, the 'target' population for aged care services, and for funding allocation, is all people aged 70 years and over and Aboriginal people aged 50 to 69 years.

17.2 Age of people in high-level residential care



Note: Percentage of people in high-level residential care (nursing homes) in 1994

Source: Adapted from Mathur 1996

In 1994, almost 30% of NT residents of high-level residential care were aged under 70 years, compared to only 10% Australia-wide (graph 17.2). This is partly because of the relatively young NT population, and partly because of the high levels of chronic disease and disability in middle-aged Aboriginal people.

Within the NT, distribution of aged care places is determined by the Commonwealth Government based on:

- population and demand data
- local information on general service demand
- local preferences for type of services, and
- the advice of the Aged Care Planning Advisory Committee (ACPAC), comprised of service providers, consumers and government agencies

After advertising funding availability, including priority areas and target groups, the final establishment of services depends on the response from service providers and community organisations.

17.3 Numbers of places

	Darwin	Katherine	Barkly	Alice Springs	East Arnhem
High level	98	20	15	86	0
Low level	71+22*	40	2	30	9*
CACP	64	17	15	45	20
MPS	3	0	0	0	0
Pilots	15+22*	12	0	27+12*	12*

Note: status as at 30 June 1999

* Places approved in principle but not yet operational

Data: Mental Health, Aged and Disability Branch, THS

Residential aged care facilities are located in Darwin, Palmerston (included with Darwin in the table above), Katherine, Tennant Creek and Alice Springs (table 17.3). There are three residential aged care facilities specifically for Aboriginal people in Darwin, Alice Springs and Katherine.

Eligibility for admission to a residential aged care facility is determined through an independent assessment mechanism. Aged Care Assessment Teams (ACAT) assess client needs for a range of aged care services and are also a source of information for frail aged people and their carers.

In 1997, the Commonwealth Government made major reforms to aged care funding and administrative arrangements. These included allowing residential

aged care services to charge accommodation bonds to provide funds for capital improvements to buildings and equipment, while reducing Commonwealth grants for this purpose. NT aged care services have a very high proportion of residents who are unable to pay an accommodation bond (termed concessional residents), which reduces the capacity of NT residential facilities to self-fund capital upgrades and expansion. Data collected by the Aged Care Branch of THS (unpublished) indicate that in 1998, 95% of residents of NT aged care facilities were concessional residents.

The Commonwealth pays a higher subsidy for concessional residents, but this must be accumulated by the service until sufficient funds are held to undertake capital works and upgrading. This may delay or restrict the ability of NT facilities with high concessional resident numbers to undertake capital upgrades.

There is a small capital allocation for services in rural and remote areas, for which Darwin is not eligible, even though many residents of aged care facilities in Darwin are Aboriginal people from remote areas where there is no local facility. This is not taken into consideration in Commonwealth funding allocation arrangements, but increases the impetus to develop alternative residential care models which are applicable to Aboriginal clients from remote communities.

Community care

The Home and Community Care (HACC) Program and Community Care Packages fund care and support for aged people living in their community. The aim of HACC (a joint Commonwealth/NT funded program) is to provide care to frail aged people and younger people with disabilities who would otherwise require residential care. Non-government, non-profit organisations are funded to provide a range of services to people living in the community in either private, community or rental housing. The range of care services includes transport, delivered meals, personal care, home help, home maintenance, specialist nursing support (eg. respiratory, continence management) and respite.

Nationally, the vast majority of HACC service recipients are frail aged people—only 19% of HACC services are provided to people aged under 65 years.

In the NT a higher percentage of younger people access HACC services. In 1993, 36% of NT HACC clients were aged under 65 years, and of these 38% were Aboriginal (DH&FS 1998).

NT HACC funding for the 1998–99 financial year was \$4,468,000 (Commonwealth \$3.07M, NT \$1.398M) (DH&AC 1998) and was allocated according to competitive assessment of submissions. In the NT in June 1999, there were 71 recurrently funded HACC services. 67% of these services, which received approximately 40% of NT HACC funds, were located outside the two major urban centres of Darwin and Alice Springs (Aged Care Branch THS, unpublished). 31% of the NT population live in these areas (ABS 1998d).

In the NT in 1999, there were 23 services providing 161 Community Care Packages (table 17.3). Many services use this funding flexibly and provide a broad range of innovative programs, which enable frail aged people to remain in their community rather than use residential services in an urban centre hundreds of kilometres away. Services for the frail aged are required in communities throughout the NT, but providing care to people living in small communities is difficult when there is only a relatively small funding allocation to each community.

Aboriginal people

In 1996, Aboriginal people occupied 1% of high level care places in residential facilities nationally, while in the NT they occupied 42% of places. This still indicated some level of under-servicing, as Aboriginal people constituted over 50% of the target group in the NT (Mathur 1996).

The location of residential care facilities in urban centres is a cause of great distress for many Aboriginal residents from remote communities and is a serious disadvantage to their families and to their communities in general.

The higher proportion of Aboriginal residents poses additional challenges to the operators of NT residential care facilities. Operators adapt their services to accommodate Aboriginal cultural requirements and observances. Providing culturally appropriate outdoor areas and assisting with arrangements for visits to residents' home communities ('reverse respite') increases the cost of residential aged care facilities.

However the majority of residents are concessional, and facilities have limited ability to provide a culturally appropriate environment.

Issues affecting remote area service delivery

The economic circumstances of Aboriginal communities are poor, with high unemployment and poorly developed commercial enterprises. Primary health care services are limited. Community infrastructure, including community organisations which in other places provide many support services to aged and disabled people, are also poorly developed. The ability of many communities to support their aged people and offer community-based care is thus very limited. However, development of aged care services in remote communities clearly has cultural and social benefits for aged people and their families. The development of aged care services, particularly labour-intensive residential services, would also increase community infrastructure and employment in these communities.

Other difficulties in the operation of an aged care service in a remote community include the need to contend with:

- staffing difficulties (high staff turnover, high costs for recruitment and retention of staff, difficulties accessing training)
- very high freight costs, and infrequent or unreliable transport services, causing increased costs of commodities and services
- distance from specialist services or supports, and from other aged care services
- climatic conditions affecting accessibility to, and productivity of, the community and the service
- rapid deterioration of capital infrastructure items including buildings, equipment and vehicles
- a relatively mobile population

Innovative care services

The challenge of providing care services in a manner that meets the needs of aged people and which is viable and sustainable is significant. Flexible, innovative and well coordinated services are required.

In the late 1990s the Commonwealth Government funded seven flexible aged care pilot services in

remote NT communities, including Borroloola, Yuendumu and Docker River. These services were established to provide a range of care (community-based and residential) to meet the needs of their frail aged people. Pilot services are also being developed for the Tiwi Islands, Maningrida, Anmatjere and Angurugu.

The small community of Belyuen has developed a Multi Purpose Service (MPS) which improves the viability of a range of health and community care services. The MPS contracts with a range of government agencies which fund specific services, each of which would be difficult to deliver in isolation in a small community. In so doing, several small services become one larger service, with resultant economies of scale and reduced duplication. The MPS retains some flexibility to change the priority on particular services at any given time to meet community requirements. Greater financial efficiency and service coordination improves the overall provision of services for people at Belyuen, and provides the potential for integrated assessment and case management for individual clients.

Dementia and other illnesses

Dementia is a disorder of memory and thinking severe enough to interfere with a person's life (Sach 1996). The incidence of dementia increases with age, particularly after the age of 80 years.

The gradual loss of memory in people with dementia often causes depression, frustration and anger in their carers. Generally, people with dementia require higher levels of care and support than most other frail aged people, and often require specialist care services or environments to provide both protection and high quality care. Services specifically for people with dementia usually have higher operational costs than generalist services due to these increased demands. This has been recognised in the assessment criteria used to determine Commonwealth subsidy levels for each aged care resident, although these subsidies do not fully meet the additional costs incurred.

In the NT, the only facilities specifically for people with dementia are low-level care facilities in Darwin and Alice Springs. In other NT centres, people with dementia who require residential care must either

move to Darwin or Alice Springs, or are cared for in a general aged care facility or in the district hospital. In remote communities, many who do not move to one of the urban centres live in far from ideal conditions. In 1999, a psychogeriatric project was funded to provide support to carers of people with dementia in residential and community care settings.

The life expectancy of young people with serious disabilities and injuries such as severe developmental abnormalities, quadriplegia and brain damage has increased considerably in recent years with advances in medical science and practice. Similarly, older people are now living longer with a range of chronic illnesses which would previously have led to premature death. Improvements in medical care have increased the need for premature 'aged' care in severely disabled young people, and the need for specialised medical treatment (such as kidney dialysis) in older people in residential and community care (AIHW 1997a).

Respite

Respite is temporary residential care for people who are normally cared for by their family in the community. Respite is an important method of assisting people to remain in their own homes as it provides a break for their carers who must often be available 24 hours a day. Respite services are funded by the Commonwealth Government through specific respite programs, and through HACC services and residential aged care facilities.

The National Respite for Carers Program (NRCP) provides respite services for carers of the frail aged, younger people with disabilities, and people with chronic or terminal illnesses. The NRCP funds a Carer Resource Centre in each State and Territory which can provide information and resources to carers, and a number of Carer Respite Centres which can arrange respite for a carer. In the NT, there are Carer Respite Centres in Darwin (servicing the Darwin and Katherine areas), East Arnhem, and Alice Springs (servicing Central Australia). There is also a cross-border region service, based in Alice Springs, which services parts of Western Australian and South Australia adjacent to the NT borders.

Territory Health Services is also considering other flexible, innovative service models, such as slow stream rehabilitation services, transitional care and stepdown services.

Disability services

Historically, some people with profound intellectual disabilities in the NT were sent interstate, usually to Adelaide, to live in psychiatric hospitals and other large institutions because there were no such facilities in the NT. The impact of this practice for these people was that they lost contact with their families, sometimes for more than 40 years. Most of these people were Aboriginal, and those who went away lost their language, culture and identity. In turn, there was no catalyst for the development of appropriate services and supports for people with disabilities in the NT.

A national and international shift in attitudes away from institutional care in the past two decades has seen people with disabilities included in mainstream services and moved to community-based accommodation. As the large interstate institutions were closed, NT people with disabilities were no longer sent away and those already interstate were returned to the Territory. This change required the development of services within the NT to support people with disabilities.

Disability services in the NT

The late development of Territory-based infrastructure to support people with disabilities was impeded by

Defining disability

The International Classification of Impairments, Disabilities and Handicaps includes three 'dimensions' related to disability:

Impairment: any loss or abnormality of psychological, physiological or anatomical structure or function

Disability: a restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being

Handicap: a disadvantage for a given individual, resulting from an impairment or disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex and social and cultural factors) for that individual.

adapted from AIHW 1997a

the NT's relatively low revenue base and consequent dependence on Commonwealth assistance to develop facilities for people with disabilities. At the same time, there was increasing awareness of rights and responsibilities, and demand from people with disabilities and their families for more appropriate services.

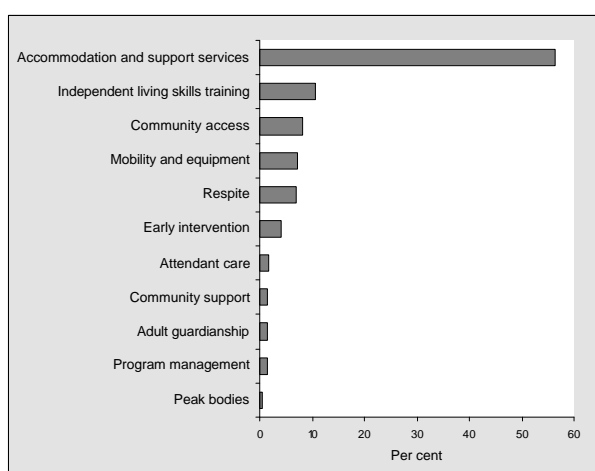
Factors that affect the delivery of disability services in the NT include:

- a relatively small number of people with disabilities scattered across a wide area
- higher rates of disability among Aboriginal people—although Aboriginal people make up only 28% of the NT population (ABS 1998b), they represent more than half of those receiving disability services (Pearce 1998)
- the absence of basic infrastructure in remote areas, making it difficult for people who live in remote areas to care for family members with disabilities
- greater costs associated with delivering services in remote areas
- widespread substance abuse and trauma in the comparatively young Territory population, accompanied by the emerging problem of challenging behaviours

Funding for disability services

Territory Health Services is the main funding source for disability services in the NT. In the four years 1993 to 1997, expenditure on disability services grew 41% (THS 1997a).

17.4 NT funding for disability services 1997



Source: Nur 1997

In 1997, approximately 75% of THS funding for disability services was allocated to non-government service providers. The largest proportion of this

funding was used to deliver accommodation and support services (graph 17.4).

17.5 NT people with disabilities 1996 to 2003

Year	People with a Disability
1996	4,600
2000	5,200
2003	5,600

Note: Projected number of people with a profound or severe handicap
Based on national prevalence rates derived from the 1993 Survey of Disability, Ageing and Carers, and ABS population projections
Projections based on small populations are subject to considerable variation

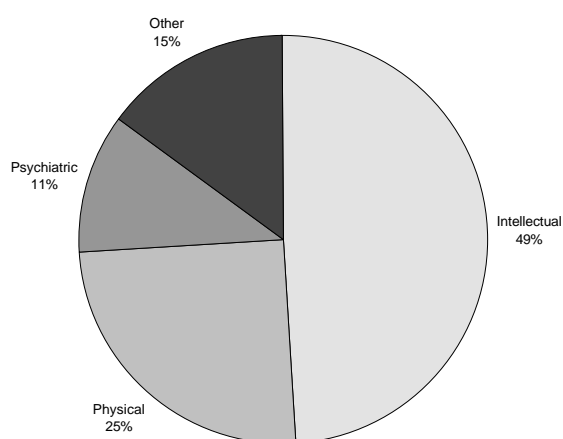
Source: Adapted from AIHW 1997b

The number of people with a disability in the NT was projected to increase by 1,000 from 4,600 in 1996 to 5,600 in 2003 (table 17.5). This will have a substantial effect on the level of funding required for disability services.

Profile of people with disabilities in the NT

In 1997, Aboriginal people made up 2.4% of the Australian population aged under 65 and received 2.5% of disability services nationwide. By comparison, in the NT, Aboriginal people made up 27% of the under 65 population and received 58% of disability services (Black & Maples 1998).

17.6 Primary disability of NT people with disabilities



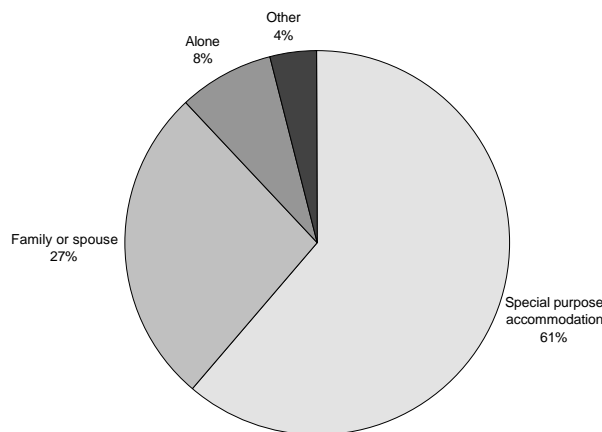
Note: Primary disability of people who used NT disability services in 1997

Source: Adapted from AIHW 1998b

Males made up a similar proportion of people with disabilities in the NT (56%) and Australia-wide (58%) in 1997 (Pearce 1998, Black & Maples 1998).

In 1997, the main disability of most people who used NT disability services was intellectual (49%) (graph 17.6), considerably lower than the national average of 67%. This contrasts with the proportions of disabled people whose main disability was physical: 25% in the NT compared with 12% nationally (Pearce 1997, Black & Maples 1998).

17.7 NT living arrangements of people with disabilities



Source: Adapted from AIHW 1998b

In 1997, there were significant differences between the NT and the rest of Australia in the living arrangements of people with disabilities. Nationally, the largest proportion of people receiving disability services (40%) were living with their family or spouse whereas, in the NT, it was 27% (graph 17.7). The largest proportion of NT service recipients (61%) were living in special purpose accommodation, more than double the national figure (30%) (Pearce 1997, Black & Maples 1998).

References

- ABS 1996, *Australia in Profile – A Regional Analysis*, cat no 2032.0, Canberra.
- ABS 1997a, *Census of Population and Housing: Selected Social and Housing Characteristics 1996*, cat no 2015.0, Canberra.
- ABS 1997b, *Census of Population and Housing: Selected Social and Housing Characteristics for Statistical Local Areas, Northern Territory 1996*, cat no 2015.7 Canberra.
- ABS 1997c, *Census of Population and Housing, Aboriginal and Torres Strait Islander People*, cat no 2034.0, Canberra.
- ABS 1997d, *Demography, Northern Territory, 1996*, cat no 3311.7, Darwin.
- ABS 1998a, *Population Projections, 1997 to 2051*, cat no 3222.0, Canberra.
- ABS 1998b, *Australian Demographic Statistics December Quarter 1997*, cat no 3101.0, Canberra.
- ABS 1998c, *Census of Population and Housing, Aboriginal and Torres Strait Islander People, NT*, cat no 2034.7, Canberra.
- ABS 1998d, *Population Northern Territory*, cat no 3234.7 Canberra.
- ABS 1998e, *Indigenous Disability Data, Current Status and Future Prospects*, ABS, AIHW and H&FS, Canberra.
- AIHW 1996, *The Demand for Disability Support Services in Australia*, cat no AIHW-406, Canberra.
- AIHW 1997a, *Australia's Welfare 1997*, Canberra.
- AIHW 1997b, *Demand for Disability Support Services in Australia: Size, Cost and Growth*, cat no DIS8, Canberra.
- AIHW 1997c, *Disability Support Services Provided Under the Commonwealth/State Disability Agreement: National Data*, Canberra.
- AIHW 1998a, *Nursing homes in Australia—1996–1997: A Statistical Overview*, cat no AGE9, Canberra.
- AIHW 1998b, *Disability Data Briefing*, number 13, October 1998, Canberra.
- Black K & Maples J 1998, *Disability support services provided under the Commonwealth-State Disability Agreement: national data 1997*, AIHW cat no DIS12, Canberra.
- DH&AC 1998, *Commonwealth-State HACC Agreement 1998–99*, (unpublished) Canberra.
- CDH&FS 1998, *Community Care Statistics 1996–97*, Department of Health & Family Services, Canberra.
- HSH 1994, *Community Care Statistics—HACC User Characteristics*, Department of Human Services and Health, Canberra.
- Mathur S 1996, *Aged Care Services in Australia's States and Territories*, cat no AGE1, AIHW, Canberra, pp 66.
- Nur A 1997, *Funding for Disability Services in the NT* (unpublished report), Disability Services Program, THS, Darwin.
- Pearce MC 1998, *1997 Commonwealth-State Disability Agreement (CSDA) survey report*, THS Darwin.

Sach J, Flicker L & Gray L 1996, *Dementia Assessment Aid for Aged Care Assessment Teams*, Department of Health Family Services, Canberra.

THS 1997a, *Aged and Disability Services Program Evaluation Report, June 1997*, Darwin.

THS 1997b, *Disability Services Five Year Strategic Plan 1997–2001*, Darwin.

THS 1998a, *Annual Report 1997–98*, NTGP, Darwin.

THS 1998b, *Disability Services Program, Program Plan 1998–99* (unpublished report), Darwin.

United Nations Department of Public Information 1998, *Programme of Action Concerning Disabled Persons, August 1998*, United Nations Department of Public Information, New York.

World Health Organisation 1980, *International Classification of Impairments, Disabilities, and Handicaps: a Manual of Classification relating to the Consequences of Disease*, Geneva.

Yeatman A 1996, *Getting real—the final report of the review of the Commonwealth/State disability agreement*, The Executive Summary, AGPS, Canberra.

The health workforce

by Tricia Wake

This chapter discusses factors that impact on demand and retention in the NT health workforce. It examines workforce issues for nursing, medicine, the allied health professions and Aboriginal health workers, and identifies the following key issues: nursing and medicine experience similar shortages; demand exceeds supply for Aboriginal health workers; and allied health professionals have limited access to local training and new graduate opportunities.

In 1996, health and community services was one of the top four employing industries in the NT, comprising 11% of the total NT workforce (ABS 1998a). Because some occupations overlap both sectors, it is difficult to estimate their individual components. However, a 1996 survey estimated that the health sector comprised half of the NT health and community services industry (NTCS&HITAB 1996).

In 1996, the NT health sector was characterised by:

- demand for specialists in a range of areas to meet identified community needs—examples included speech pathologists, renal nurses and ear, nose and throat specialists
- undersupply of health professionals in rural and remote areas

The diversity of professions, organisations and servicing arrangements in the NT health sector has resulted in distinct segmentation of the sector (NTCS&HITAB 1996), with each profession focusing on its own needs and service delivery arrangements. This focus on individual professional responsibilities has significant impact on attempts within the health sector to adopt multidisciplinary approaches to NT health problems.

Although recruitment difficulties exist in a range of specialist areas, and retention remains a major challenge, the NT health sector has adopted various long-term strategies to address issues of supply and demand. Training and education strategies include:

- emphasising vocational education in schools
- attempts to enhance the responsiveness of higher education to industry requirements, through better links with higher education institutions
- providing a planned orientation program that prepares health professionals for working in remote areas and cross-cultural situations

- providing a framework to assist continuing professional development

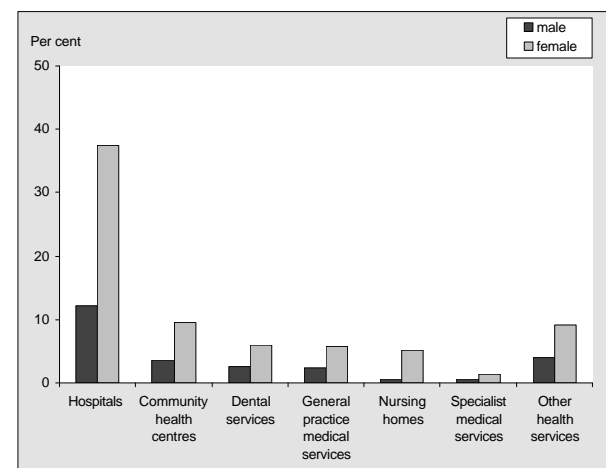
Workplace reform strategies include:

- efforts to improve flexibility in the labour market—for example, multidisciplinary operations and information technology advances
- encouraging workplace and managerial reform to maximise the benefits of available resources in delivering NT health services—for example, coordinated care trials and the chronic disease strategy

Recruitment strategies include:

- continuing the arrangements for the temporary entry of skilled health professionals from overseas and facilitating the entry of migrants to meet identified skills gaps, particularly in nursing and medicine
- improving the Territory's capacity to attract and retain health professionals by recruiting practitioners from a variety of philosophical backgrounds.

18.1 NT health workforce 1996



Notes: Proportion of NT health workforce employed in each type of health service
'Other health services' comprise pathology, optometry and opticians, ambulance, physiotherapy and chiropractic

Data: ABS 1997

In 1996, most workers in the NT health sector were females, who were well represented even in those areas that, Australia-wide, are predominantly male—

for example, medical general practice (graph 18.1). In keeping with the distribution of the NT population, most workers are employed in urban centres, with small numbers dispersed widely in remote areas (ABS 1998a).

Outside their employment as Aboriginal health workers, Aboriginal and Torres Strait Islander people are very poorly represented in the health professions despite the fact that they made up 28% of the NT population in June 1997 (ABS 1998b). In 1996, only 6.75% of workers in the NT health sector were Aboriginal (ABS 1997). A key reason for this was low education levels stemming from poor school retention rates. In 1997 in the NT, only 9.4% of Aboriginal students enrolled in Year 12, compared with 54.5% of non-Aboriginal students (DEETYA 1998a). A further hurdle for Aboriginal students from rural and remote areas is the financial and emotional difficulties that result from the need for students from rural and remote areas to leave home to obtain health qualifications.

NT health sector labour market

Unemployment rates in the health sector are generally low compared with other industries in Australia. However, changes in government budgets, higher education and population can see demand move quickly from being in balance to skills shortages. Australia-wide, vacancies for health professionals fell by 20.4% in the year to April 1998 (DEETYA 1998b). Specific figures are not available for the NT. The factors driving demand for NT health professionals are:

- the level of government funding made available to the health care sector
- government policy, both Commonwealth and NT
- the overall health status of the community
- the capacity for a broad-based recruitment strategy

Relative to the rest of Australia, the NT is a very small labour market that is sensitive to cyclical and seasonal demands (DEETYA 1998b). Across all health professions, although most workers are long-term residents, there is a small percentage of highly mobile workers. This leads to consistently high turnover in some occupational categories. An element of this turnover is managed. Managed turnover includes the use of temporary residence visas to place

overseas-trained health professionals on two- to three-year contracts in specialist areas. Where turnover is unplanned, it leads to shortages of skilled staff.

Compared with elsewhere in Australia, the NT health sector experiences skills shortages in only a small number of professions. However, one of the most important factors in the NT is the need to be sensitive to the unique circumstances of a large Aboriginal population whose health status produces high demand for services from all health professions. The dispersal of the NT population over remote areas and the ramifications of poor Aboriginal health impact significantly on health workforce issues in the NT. These factors influence demand, specialisations, experience levels, recruitment and retention strategies, government priorities and policies, and the need for the workforce to consider a wide range of cross-cultural issues in delivering health services.

The Department of Employment, Education, Training and Youth Affairs (DEETYA 1998b) identified NT skills shortages as being caused by a combination of supply and demand factors. Supply factors that cause skills shortages are:

- wastage—through students dropping out during training, NT residents who study interstate not returning to the NT on graduation, and qualified workers no longer working in their field
- the need for a more consistent approach in preparing health professionals to work in remote areas, particularly awareness of cross-cultural issues and professional development
- the continuing need to refresh and improve skills as the introduction of new technology results in changed work practices

Demand factors that cause NT skills shortages are:

- economic and demographic changes
- lack of flexibility in wages, conditions and work practices, particularly in relation to the unique requirements of remote area practice
- recurring fluctuations in labour demand caused by seasonal factors, particularly in nursing which experiences shortages in the hotter months of October to March each year
- most health professionals being concentrated in urban areas, whereas the needs are greatest in remote areas

A major factor that impacts on the NT labour market is its dependence on interstate and overseas recruitment to fill most vacancies in the health professions. This makes the NT labour market vulnerable to change, and factors that contribute to skills shortages Australia-wide ultimately filter down to impact on health service delivery at the local level.

Nursing

Workforce characteristics

The nursing workforce was by far the largest occupational category in the NT health sector in 1996 (ABS 1998a).

18.2 NT nurses registration 1998

Nurses Board of the NT	
Division of Registration	Per Cent
General	80
Psychiatric	5
Enrolled	12
Mothercraft	1
Child welfare	2
Midwifery	35
Mental health	1

Note: Total is more than 100% because some nurses enrol in more than one division

Source: THS 1999

In 1998, the NT nursing workforce was characterised in the following ways (THS 1999). In relation to age and gender:

- 94% of all nurses registered with the Nurses Board of the NT were female
- their average age was 42.5 years, indicating an ageing workforce

In terms of their specialisations:

- 80% of nurses registered with the Nurses Board of the NT were generalists
- 63% of nurses worked at levels 1, 2 and 3

Regarding their employment:

- least nurses worked in the areas of mental health and aged care—2% and 1% respectively
- 90% of nurses were employed either full time or part time
- 70% of nurses were urban-based, in Darwin and Alice Springs
- 71% of nurses were employed in the public sector
- there was a large core of long-term residents—that is, those who had lived in the NT for more than two years—offset by a small but highly mobile group who accounted for high turnover

Labour supply

The NT's nursing workforce is generally in balance, except for skills shortages in midwifery and rural areas. However, given the NT's dependence on interstate and overseas recruitment of nurses, the

following issues are likely to be of particular importance. In the long-term, Australia-wide, there were expected to be decreases in the numbers of resident students and registered enrolled nurses, accompanied by increases in patient demand (THS 1999). The expected shortage of registered nurses worldwide by the year 2002 is likely to exacerbate this situation (AIHW 1998c).

Although the NT labour market for nurses continues to depend on interstate recruitment as a major source of supply, the following training arrangements were available at the Northern Territory University (NTU) in 1999:

- Bachelor of Nursing—pre-registration, post-registration and honours
- Graduate Diploma—midwifery, renal nursing, health education and health studies
- Master of Nursing—by research
- Master of Midwifery
- Bachelor of Health Studies—ambulance
- Refresher courses for nurses returning to the workforce or updating their training
- Certificate 4 for Enrolled Nurses

NTU's Bachelor of Nursing program accounted for 109 of the 208 students who undertook health-related studies at NTU in 1997 (NTCS&HITAB 1998). Given that there were only 19 nursing graduates for 1997, the number of locals graduating was still insufficient to meet local demand. Australia-wide, nursing graduates dropped by 12% between 1993 and 1996, and the number of students starting nursing courses fell by 11.4% between 1991 and 1996 (AIHW 1998c).

The 1998 *NT Nurses Survey* indicated high turnover and high demand in all areas of NT nursing. One of the main recommendations of this survey was targeted retention strategies to maintain a balanced labour market in nursing (THS 1999).

In 1998, Territory Health Services (THS) was the largest employer of nurses in the NT. To foster further professional development, THS complements accredited courses of study with a number of internal training and development initiatives. Some examples of formal training are:

- Intensive Care Certificate through the University of NSW
- Neonatal Intensive Care course
- placement for NT undergraduates interstate (in SA and WA) and overseas (in Wyoming, Birmingham and Sheffield)

- Anaesthetics
- Trauma Nurse core course
- Paediatric Trauma course
- the partnership arrangement with Flinders University operating in Central Australia

Examples of informal THS training and development initiatives include:

- self-directed learning packages
- courses conducted in association with Royal Adelaide Hospital—for example, wound care and palliative care
- pathways development for registered nurses
- orthopaedics
- high dependency course
- hyperbaric medicine

Despite these initiatives, there continues to be high demand for nurses with specialist skills. One strategy to address this is the placement of skilled specialists from overseas, through the granting of temporary residence and working visas.

Wastage, particularly of qualified workers who no longer work in their field, is another factor that impacts on the supply of nurses in the NT. Although there is a lack of precise data, anecdotal reports suggest that a substantial number of registered nurses work in administration and related fields.

Occupational demand

The chief factor driving demand for NT nurses appears to be high turnover among the small but highly mobile group of nurses who work mainly in Darwin and Alice Springs. The reasons for turnover within this group are extremely varied—for example, travel, family commitments, spouse on defence forces posting—but most are on short- to medium-term contracts and leave once their contracts expire. Historically, this has resulted in unacceptably high staff turnover in the NT. Experienced workers appear to be most in shortage, particularly those with skills in renal nursing, adult critical and intensive care, midwifery, neonatal intensive care, perioperative nursing, orthopaedic nursing and paediatric nursing (THS 1999).

In 1995, the NT was 10% below the national average—as were NSW, Queensland and the ACT—in the number of nurses employed for every 100,000 people. By contrast, Victoria and South Australia, were 16% above the national average (AIHW 1998c). An important factor in this is the NT's focus on using Aboriginal health workers to deliver primary health care services in clinical practice, particularly in remote areas.

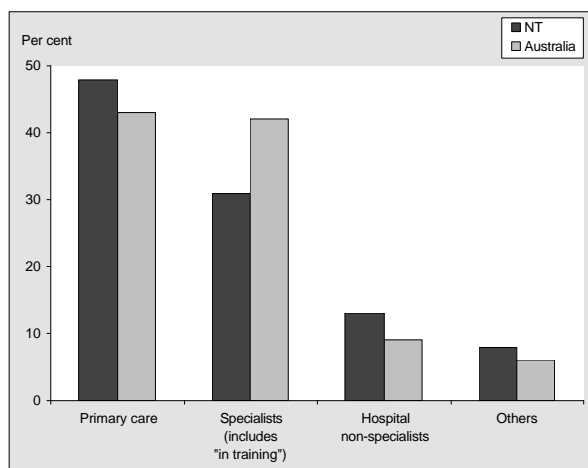
Medicine

Workforce characteristics

The obstacles faced in attracting, and retaining, doctors to remote areas have been widely recognised and documented. *The Medical Workforce in Rural & Remote Australia* (AMWAC 1996) identified the following nine key factors that act as disincentives to rural and remote medical practice:

- the image of rural and remote practice
- undergraduate education issues
- postgraduate training issues
- professional isolation
- time commitment
- infrastructure issues
- financial costs
- spouse and family issues
- uncertainty about the future viability of rural health services

18.3 NT and Australia, doctors employment 1996



Notes: 'Primary Care' means doctors who are the first point of contact for patients—for example, general practitioners and district medical officers
'Others' comprise public and occupational health

Source: Adapted from AIHW 1998c

In the 1990s, the Australian medical workforce was characterised by: oversupply of general practitioners in urban areas; shortage of specialists; and undersupply of doctors in rural and remote areas, with a reliance on doctors on temporary residence visas to fill remote area shortages (AMWAC 1996). These factors had a major impact on recruitment and retention in the NT, and suggest an explanation for the NT's shortage of specialists in 1996 (graph 18.3).

In 1996, the NT medical workforce could be characterised in the following ways (AIHW 1998c). In relation to the age and gender of NT doctors:

- most were males—74%

- 54% were aged 35 to 55 years
- most were Australian-born, although 11.5% of NT doctors obtained their initial qualification in Asia compared with the national average of 5.7%

Regarding NT doctors' employment:

- 94% worked mainly in primary health care, or as hospital non-specialists or specialists (graph 18.3)
- 6% worked in public health and occupational health
- 40% worked more than 50 hours a week

The annual turnover of doctors in remote areas was around 30%, with the trend towards increasing turnover in the 1990s (AMWAC 1996).

Labour supply

The NT continues to depend entirely on interstate and overseas recruitment for its medical workforce. Australia-wide, students from rural areas who enter medical school are the most likely to work in rural or remote areas once qualified. The NT is doubly disadvantaged in that it is remote, and very few students from the NT go on to study medicine interstate. To address these major disincentives to remote practice and assist in long-term recruitment, the Commonwealth and NT governments developed the following initiatives:

- an affiliation agreement with Flinders University to establish the NT Clinical School
- placements for Flinders University medical students in remote areas of the NT
- allocation of places for NT residents to enrol in Flinders University's medical degree
- research positions in the NT
- a rural surgeon training program

The NT Rural Workforce Agency, which replaced the General Practitioner Rural Incentive Program, puts in place initiatives to assist the recruitment and retention of rural and remote doctors. It plays an important role in addressing shortages, as does the use of skilled migrants in specialist areas and the use of temporary residence visas to bring doctors to urban and regional centres.

Occupational demand

The NT has a shortage of general practitioners in remote areas and a shortage of specialists in all urban and regional centres. To encourage graduating doctors to take up positions in remote areas, the NT forged important links with Flinders University. The shortage of specialists was rectified in part by providing outreach services. In 1994, there were 224 practicing

clinicians for every 100,000 people in the NT compared with the national average of 246 clinicians (AIHW 1998c). Again, the main factors contributing to demand were high turnover of doctors through the public health system, lack of flexibility in employment conditions and lack of specific training to prepare general practitioners to meet the unique requirements of remote area practice (AMWAC 1996).

Allied health professions

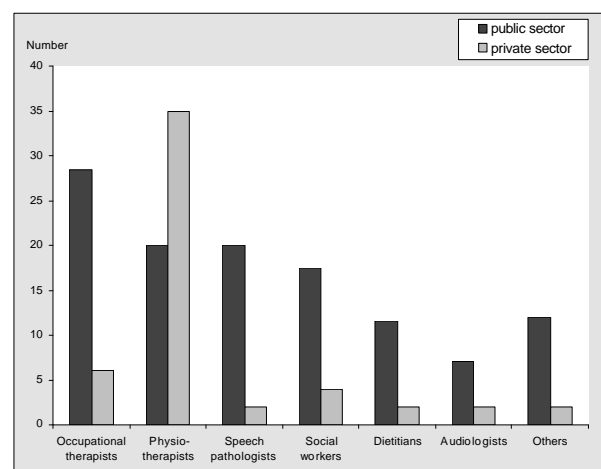
Workforce characteristics

In the NT, the allied health workforce is both diverse and fragmented, the latter because there is no single body representing the interests of allied health disciplines generally. For the purposes of this discussion, 'allied health' means the following professions:

- audiologists
- speech pathologists
- occupational therapists
- physiotherapists
- social workers
- dietitians
- prosthetists
- orthotists
- podiatrists

Shortages of allied health professionals are not widespread throughout Australia, except in some specialties, such as physiotherapy, and in rural and remote areas (DEETYA 1998b). The NT reflects the national picture.

18.4 NT allied health workforce 1996



Note: 'Others' comprise prosthetists, orthotists and podiatrists

Data: Strategic Workforce Planning Unit, THS

Most allied health professionals, with the exception of physiotherapists, are employed in the public sector

in the NT (graph 18.4), whereas there are higher proportions in private practice elsewhere in Australia (ABS 1998a).

An accurate assessment of the allied health workforce in the NT is difficult because of the lack of supporting data or conflicting data, the latter being a product of the different methods of collection and classification used by ABS and AIHW. For the purpose of this section, data from these sources have been amalgamated. Although definitive data are not readily available, the NT's allied health workforce is characterised in the following ways. In relation to gender and country of origin:

- allied health professionals are predominantly female
- most are Australian-born or from the UK, Ireland, NZ and Canada

Regarding allied health employment:

- the largest categories are social work and physiotherapy
- the smallest categories are prosthetists, orthotists and podiatrists
- most are full-time permanent employees
- there is a small number of part-time employees
- most are based in Darwin and Alice Springs, and employed in hospitals or community service organisations

In terms of turnover:

- there is high wastage, with many allied health professionals not working in their field or not in the workforce
- there is high turnover and a small core of long-term residents—that is, those who have lived in the NT for more than two years

Labour supply

There were limited allied health training and new graduate opportunities in the NT in 1999. NTU offered undergraduate and postgraduate courses in social work, but NT residents needed to move interstate to access education and training opportunities in areas such as physiotherapy, speech pathology and occupational therapy. This presents a major barrier for NT residents who want to train and take up NT employment in these professions.

As part of an Australia-wide strategy to encourage graduates to take up employment in rural and remote areas, there is an opportunity for allied health students to undertake clinical placements in the NT (NTCS&HITAB 1998). However, these training placements cannot be capitalised on because, except

in social work, the NT does not provide base level positions for allied health graduates.

Occupational demand

Key contributors to demand for allied health professions in the NT are:

- the high turnover of the allied health workforce across all disciplines; and
- this sector's funding in relation to other health priorities

The limited data available indicates that the NT allied health labour market remains in balance, with supply meeting demand except for short-term relief positions (locums). However, there is a perception among allied health professionals that the priorities of the health budget inhibit effective service delivery within a primary health care environment. For this reason, most allied health activities are confined to urban and regional centres despite the needs of people in remote areas.

Aboriginal health workers

Workforce characteristics

Aboriginal health workers undertake a unique role in assisting to deliver primary health care to the NT's Aboriginal people.

Although limited statistical data are readily available, the principal consultant Aboriginal health worker with THS indicates that the Aboriginal health worker workforce can be characterised in the following ways. In terms of age and gender, Aboriginal health workers are most often female and of mature age. Regarding their qualifications for practice, they are:

- usually nominated by the community in which they practise
- registered with the NT Professional Registration Board as Aboriginal Health Workers
- practising clinicians

In relation to their employment, in 1996 (ABS 1997):

- 63.4% of Aboriginal people employed in the health sector were Aboriginal health workers
- most were employed in the public sector

Most Aboriginal health workers work in rural and remote areas of the NT.

In 1998, there were 387 Aboriginal health workers registered with the NT Professional Registration

Board. Not all were working as Aboriginal health workers. Some were no longer in the workforce, but others worked in related areas of administration, environmental health or public health promotion. Despite this wastage, there was little evidence to suggest that many Aboriginal health workers had crossed over into other health professions—for example, nursing or medicine—and it appeared that these areas were not perceived as relevant career paths (NTCS&HITAB 1998).

Labour supply

In remote areas, Aboriginal health workers are nominated by their own community whereas, in urban centres, they may nominate themselves. In 1999, Aboriginal health worker training was provided through:

- Batchelor College, Danila Dilba Aboriginal Medical Service and Wurli Wurlinjang Health Service in the Top End
- Central Australian Aboriginal Congress Inc and Anyinginyi Congress in Central Australia

Other NT Aboriginal medical services may also have their own training programs for Aboriginal health workers. Ongoing professional support is provided through the Central Australian Rural Health Training Unit in Alice Springs. In THS, Aboriginal health worker managers and the principal consultant Aboriginal health worker also provide support to Aboriginal health workers.

At the end of the 1990s, issues particular to the training of Aboriginal health workers included the need to:

- attract new trainees, given that most workers are of mature age
- develop education and training strategies to ensure adequate numbers in the long term
- improve retention in remote areas
- reduce wastage during training
- facilitate the transfer of skills between the NT and other states
- provide career paths and professional development in specialist areas, and advanced clinical skills

In 1998–99, THS introduced a new career structure for the Aboriginal health workers it employed. This structure relied heavily on Aboriginal health workers attaining formal qualifications and core competencies under the National Aboriginal Health Worker Competency Standards.

Occupational demand

Because nomination is generally community-based, supply and demand could be expected to remain in balance. However, this is not the case. Aboriginal health work has a high wastage rate, both during training and on the job, with many registered Aboriginal health workers no longer practising in their field. Although limited information is available, there are suggestions of difficulties in filling senior positions that require extra qualifications and skills in management and administration.

The difficulties in Aboriginal health in the NT have been well documented (see, for example, Bartlett & Legge 1996). In 1992–94, life expectancy at birth was 57 years for NT Aboriginal males compared with 75 years for non-Aboriginal males in Australia, and 61 years for NT Aboriginal females compared with 81 years for non-Aboriginal females in Australia (Anderson, Bhatia & Cunningham 1996). In attempting to deal with the major problems in the health status of Aboriginal people, the NT has adopted the primary health care model of practice. Aboriginal health workers are a key component in this and will continue to play an integral role in the future.

References

- ABS 1998a, *1996 Census of Population and Housing: Selected Family and Labour Force characteristics for Statistical Local Areas, Northern Territory*, cat no 2017.7, Canberra.
- ABS 1998b, *Demography, Northern Territory*, cat no 3311.7, Darwin.
- ABS 1997, *1996 Census of population and housing*, (unpublished CDATE census tables), cat no 2019.0.
- AIHW 1996, *Australian Medical Workforce Benchmarks*, AMWAC Report 1996.1, Sydney.
- AIHW 1998a, *Australia's Health 1998*, cat no AUS 10, Canberra.
- AIHW 1998b, *Medical Labour Force 1996*, cat no HWL 10, Canberra.
- AIHW 1998c, *Nursing Labour Force 1995*, cat no HWL 8, Canberra.
- AIHW web site: <http://www.aihw.gov.au>
- AMWAC 1996, *The Medical Workforce In Rural & Remote Australia*, AMWAC Report 1996.8, Sydney.

- AMWAC & AIHW 1996, *Female Participation In The Australian Medical Workforce*, AMWAC Report 1996.7, Sydney.
- AMWAC & AIHW 1997, *Characteristics of Students Entering Australian Medical Schools 1989 to 1997*, AMWAC Report 1997.7, Sydney.
- Anderson P, Bhatia K & Cunningham J 1996, *Mortality of Indigenous Australians, 1994*, ABS cat no 3315.0, AIHW cat no IHW1, AGPS, Canberra.
- Bartlett B & Legge D 1994, *Beyond the Maze, Proposals for More Effective Administration of Aboriginal Health Programs*, CAAC, Alice Springs, & NCEPH working paper no 34, ANU, Canberra.
- DEETYA 1997, *Selected Higher Education Student Statistics*, AGPS, Canberra.
- DEETYA 1998a, *NT Labour Market Profile*, DEETYA Labour Economics Office, Indigenous Education Branch, Canberra.
- DEETYA 1998b, *Skills in Australia—Trends and Shortages*, DEETYA Analysis and Evaluation Division, Canberra.
- DEETYA web site: <http://www.deetya.gov.au>
- Graduate Careers Council of Australia web site: <http://www.gradlink.edu.au>
- NTCS&HITAB 1996, *Mapping Project Report 1996*, Darwin.
- NTCS&HITAB 1998, School to work project report October 1998, (unpublished report), Strategic Workforce Planning Unit, THS, Darwin.
- NTU web site: <http://www.ntu.edu.au>
- THS 1999, NT nurses survey, (unpublished report), Strategic Workforce Planning Unit, Darwin.

Death statistics

Causes of death

by John Condon and Karen Dempsey

This chapter examines death statistics for Aboriginal and non-Aboriginal Territorians, in particular life expectancy, most common causes of death and death rates for all causes of death, including for particular age groups.

In the years 1979 to 1997, 12,686 NT residents died in the NT. This does not include interstate or overseas residents who died while visiting the NT, nor NT residents who died interstate. Over the same period the NT population increased by 64% (ABS 1997a, 1997b). The number of deaths also increased, although not to the same extent, from almost 600 per year in the late 1970s to almost 800 per year in the late 1990s.

Death rates are a measure of overall population health. Higher death rates in one group of people indicate that their overall health status is worse than that of other groups, and that members of that group are likely to die at a younger age. NT death rates are higher in males than females, and much higher in Aboriginal than non-Aboriginal people: males account for almost two-thirds of deaths, although comprising just over half of the population; Aboriginal people account for approximately half of all deaths, although comprising less than a third of the population.

Although Aboriginal Territorians have higher death rates than other Australians at all ages, the differences are more marked in some age groups than others. Between the early 1980s and early 1990s, death rates fell in younger NT Aboriginal people while they rose in older NT Aboriginal people. The pattern of deaths in each age group needs to be examined to see the changes in health status that are occurring in NT Aboriginal people.

Life expectancy

Life expectancy at birth is the number of years that a newborn child can expect to live if the current pattern of death rates in each age group remains the same throughout the child's life.

19.1 Life expectancy at birth 1981 to 1995

	Age at Death		Australia
	NT Aboriginal	NT non-Aboriginal	
Male			
1981 to 1985	56.2	72.5	72.3
1986 to 1990	55.0	74.1	73.8
1991 to 1995	57.7	74.6	75.6
Female			
1981 to 1985	61.9	81.8	79.7
1986 to 1990	60.7	86.8	80.9
1991 to 1995	62.2	83.8	82.3

Source: Dempsey & Condon 1999

In the period 1981 to 1995, life expectancy at birth was (table 19.1):

- 75 years for NT non-Aboriginal males, similar to that of Australian males overall (76 years), but only 58 years for NT Aboriginal males—an NT Aboriginal boy born in the early 1990s could expect to live almost 18 years less than other Australian boys
- 84 years for NT non-Aboriginal females, similar to that of Australian females overall (82 years), but only 62 years for NT Aboriginal females—an NT Aboriginal girl born in the early 1990s could expect to live 20 years less than other Australian girls

Between the early 1980s and the early 1990s, life expectancy increased by three years for Australians generally and by two years for non-Aboriginal Territorians but only by 1.5 years for NT Aboriginal males and hardly at all for Aboriginal females.

The lower expectations of life for NT Aboriginal people largely reflect the much higher death rates of young adults (refer to graph 19.15). It is premature adult death, not excess infant death, that accounts for most of their reduced life expectancy (Thomson 1991). As measured by life expectancy, the health status of NT Aboriginal people is much worse than that of other Australians and the health gains being achieved by other Australians are not being shared by NT Aboriginal people.

Most common causes of death

19.2 Most common causes of death 1979 to 1995

	NT		NT Non-		Australia	
	Rank	%	Rank	%	Rank	%
Male						
Circulatory	1	25.4	2	24.8	1	44.0
Cancer	4	9.2	3	20.3	2	25.7
Injury	2	19.1	1	27.7	3	8.7
Respiratory	3	17.6	4	8.3	4	8.5
Endocrine	7	3.9	7	2.3	6	2.3
Genito-urinary	12	2.3	13	0.8	8	1.3
Communicable	5	4.6	10	1.5	13	0.6
Female						
Circulatory	1	23.4	1	26.6	1	50.9
Cancer	3	11.3	2	25.9	2	23.2
Respiratory	2	18.5	4	8.6	3	6.2
Injury	4	9.8	3	15.6	4	4.3
Endocrine	5	7.4	8	3.1	6	2.6
Genito-urinary	8	4.7	12	0.7	8	1.9
Communicable	6	5.6	13	0.7	13	0.6

Source: Dempsey & Condon 1999

In order of importance, the most common causes of death for all Australians in the years 1979 to 1995 were circulatory disease and cancer (table 19.2). Ranked third was injury for males and respiratory diseases for females. Circulatory disease was the most common cause of death in the NT, except for non-Aboriginal males, in whom injury deaths were more common.

Injury deaths were more common in all NT population groups than in Australia generally in the 17 years to 1995:

- for NT males, injury accounted for 19% of Aboriginal deaths and 28% of non-Aboriginal deaths compared with 9% of Australian male deaths
- for NT females, injury accounted for 10% of Aboriginal deaths and 16% of non-Aboriginal deaths compared with only 4% of Australian female deaths

This was partly because of the younger age structure of the NT population (injury deaths are more common in young people) and partly because of the higher injury death rates in all age groups in the NT. For more information, see the Injury and violence chapter.

Although circulatory disease and cancer were among the most common causes of death in the NT, the proportion of deaths from these causes was less in the NT than in Australia generally. Because death from these diseases is more likely in old age, they account for a smaller proportion of deaths in the NT's younger population.

In Aboriginal Territorians, respiratory disease was a more common cause of death than in non-Aboriginal Territorians or Australians generally. Between 1979 and 1995, respiratory disease was the second most common cause of death in NT Aboriginal females and the third most common in NT Aboriginal males.

All causes of death

The age-adjusted death rates for all causes of death in Australians, both males and females, decreased steadily over the past two decades, as did those of non-Aboriginal Territorians. For most of the past two decades, the death rate of NT non-Aboriginal males was slightly less, and that of non-Aboriginal females considerably less, than Australian rates.

The death rates of Aboriginal Territorians, both males and females, were several times higher than Australian rates. However, the difference between NT Aboriginal and Australian rates was much greater in some age groups than others. Death rates of Aboriginal Territorians are considered in more detail for specific age groups later in this chapter.

19.3 All causes of death 1981 to 1997

	NT	NT Non-	Australia
	Aboriginal	Aboriginal	
Male			
1981 to 1985	2,094.1	991.0	1,035.3
1986 to 1990	2,501.0	883.1	937.8
1991 to 1995	2,228.2	880.0	842.1
1996 to 1997	2,108.7	760.4	806.8
Female			
1981 to 1985	1,614.8	570.0	639.3
1986 to 1990	2,026.8	448.4	593.8
1991 to 1995	1,814.5	502.5	545.0
1996 to 1997	1,691.3	460.6	527.9

Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

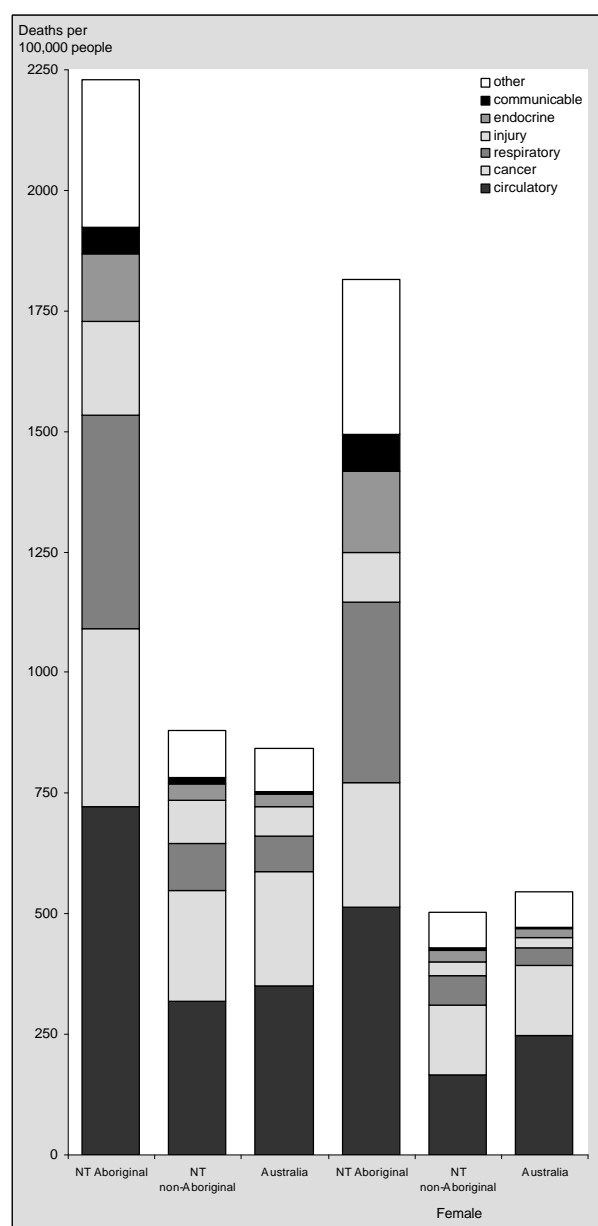
For Australians and for non-Aboriginal Territorians, death rates decreased between the early 1980s and the two years 1996 to 1997. This decrease was over 20% for males and almost 20% for females (table

19.3). In 1996 to 1997, the death rates of NT non-Aboriginal Territorians were lower—6% lower for males and 15% lower for females—than Australian rates.

In 1991 to 1995, for the six most common causes of death among NT Aboriginal people, their death rates were much higher than for NT non-Aboriginal people or Australians generally.

Compared with Australians, the death rates of non-Aboriginal Territorians were slightly higher for respiratory, endocrine and communicable diseases and injury, but lower for circulatory disease—9% lower for males and 33% lower for females (graph 19.4 and table 19.5).

19.4 All causes of death 1991 to 1995



Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

19.5 All causes of death 1991 to 1995

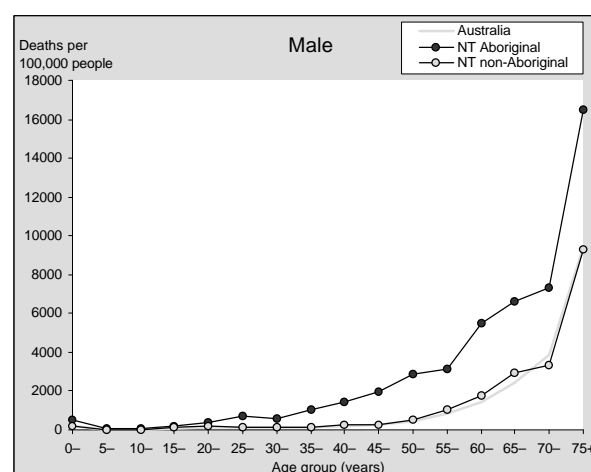
	NT Aboriginal	NT Non- Aboriginal	Australia
Male			
Circulatory	722.5	317.5	349.9
Cancer	369.0	231.7	236.5
Respiratory	441.0	97.2	74.2
Injury	197.1	87.6	60.3
Endocrine	137.8	35.2	26.1
Communicable	56.0	14.0	6.6
Other	304.8	96.8	88.5
Total	2,228.2	880.0	842.1
Female			
Circulatory	512.6	165.7	248.4
Cancer	259.8	145.3	143.4
Respiratory	373.9	60.5	37.0
Injury	101.3	30.0	23.0
Endocrine	170.9	22.2	16.4
Communicable	76.0	5.0	4.1
Other	320.0	73.8	72.7
Total	1,814.5	502.5	545.0

Note: Age-adjusted death rates per 100,000 people, standardised to Australian 1991 population

Source: Dempsey & Condon 1999

Patterns of death by age

19.6 Male death rates 1991 to 1995

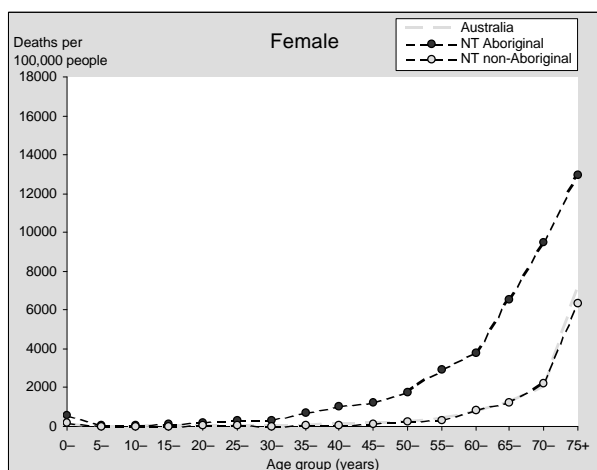


Note: Death rates for all causes, by five-year age groups, per 100,000 people

Source: Dempsey & Condon 1999

For the years 1991 to 1995, the death rates of NT non-Aboriginal males and females were similar to those of Australians at all ages whereas the death rates of NT Aboriginal people were higher than those of Australians at all ages—so much so that the death

19.7 Female death rates 1991 to 1995

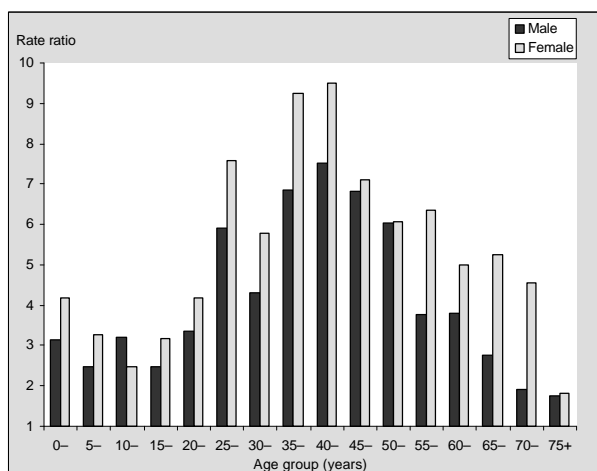


Note: Death rates for all causes, by five-year age groups, per 100,000 people

Source: Dempsey & Condon 1999

rates of young adult Aboriginal Territorians resembled those of Australians twenty to thirty years older (graphs 19.6 and 19.7).

19.8 NT Aboriginal:Australian death rate ratios 1991 to 1995



Note: Ratio of NT Aboriginal to Australian death rates for all causes by five-year age groups

Source: Dempsey & Condon 1999

Over this same period, however, the difference between NT Aboriginal and Australian death rates was much greater in some age groups than others (graph 19.8). Although death rates are much higher in older people, and rise rapidly after age 65 (see, for example, graphs 19.6 and 19.7), the difference between NT Aboriginal and overall Australian death rates (as measured by the ratio of their age-specific death rates) was much greater in young adults than in older people.

Compared with Australian death rates in the period 1991 to 1995, NT Aboriginal death rates were:

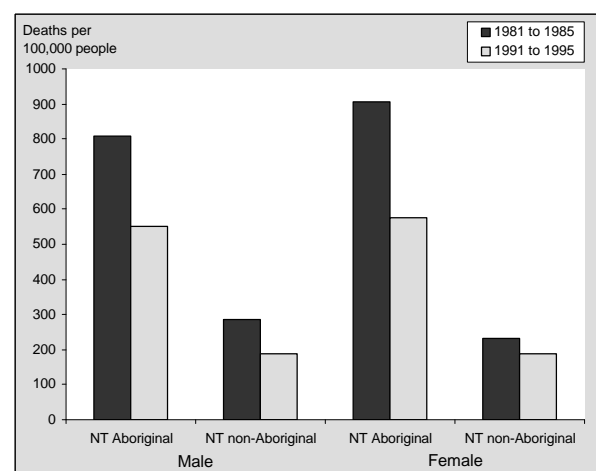
- about twice as high in people aged 75 and over
- about three times as high in those aged under 20
- many times higher in younger adults, peaking in 40- to 44-year-olds, for whom death rates were seven times higher than the Australian rate for males and nine times higher for females

The ratio of NT Aboriginal to Australian death rates was higher for females than for males in almost all age groups.

Death rates and the most common causes of death in each age group are two measures of the relative health status of population groups at different stages of life. The sections below examine NT death statistics in five age groups: young children (aged under five years); older children and young people (aged five to 24 years); young adults (aged 25 to 44 years); middle-aged people (aged 45 to 64 years); and older people (aged 65 years and over).

Young children

19.9 NT death rates: under five years 1981 to 1995



Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

19.10 Death rates: under five years 1981 to 1995

	NT Aboriginal	NT Non-Aboriginal	Australia
Male			
1981 to 1985	806.8	285.0	272.7
1991 to 1995	549.0	189.0	175.1
Female			
1981 to 1985	907.1	231.8	212.7
1991 to 1995	577.4	187.6	137.8

Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

The death rate of all NT children aged under five years declined substantially between 1981 and 1995:

- the non-Aboriginal death rate fell by over 20%
- the Aboriginal death rate fell by over 30%

Despite this decline, the death rate of young NT Aboriginal children remained much higher than that of their Australian counterparts: three times higher for boys and four times higher for girls during the years 1991 to 1995 (graph 19.9 and table 19.10).

In 1991 to 1995, for children under five years, NT non-Aboriginals had a similar death rate to Australians generally.

19.11 NT most common causes of death: under five years 1979 to 1995

NT Aboriginal		NT Non-Aboriginal	
Cause	%	Cause	%
Perinatal	28.2	Perinatal	37.3
Respiratory	14.3	Congenital	21.5
Congenital	13.2	Injury	18.8

Note: Proportion of all deaths in this age group

Source: Dempsey & Condon 1999

Between 1979 and 1995, the most common cause of death for NT children aged under five years, both Aboriginal and non-Aboriginal, was conditions that originate in the perinatal period (table 19.11) such as infections which occur immediately before or after birth, high maternal blood pressure during pregnancy or complications during birth. Next most common were: for Aboriginal children, respiratory diseases and congenital abnormalities; and, for non-Aboriginal children, congenital abnormalities and injury.

Older children and young people

19.12 Death rates: five to 24 years 1981 to 1995

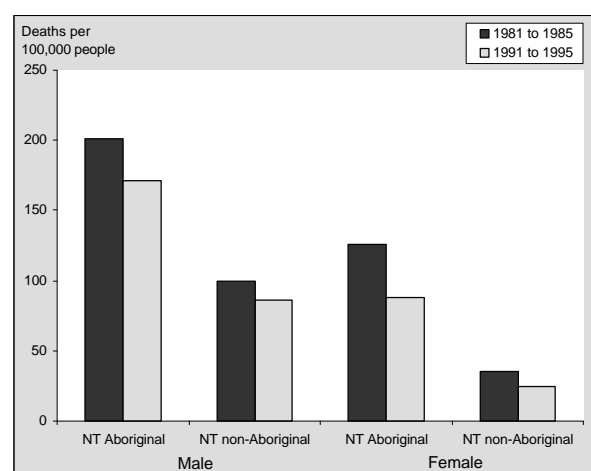
	NT Aboriginal	NT Non-Aboriginal	Australia
Male			
1981 to 1985	201.0	99.8	82.8
1991 to 1995	171.5	86.1	62.0
Female			
1981 to 1985	125.8	35.3	31.7
1991 to 1995	88.0	24.6	26.8

Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

As for NT children aged under five years, the death rates of both Aboriginal and non-Aboriginal Territorians

19.13 NT death rates: five to 24 years 1981 to 1995



Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

aged from five to 24 years fell between 1981 and 1995: male death rates by 15% and female death rates by 30% (graph 19.13 and table 19.12). In this age group, Australian rates also declined over this period. However, by 1991 to 1995, NT Aboriginal rates remained approximately three times higher than Australian rates.

In both the NT and Australia generally, males aged five to 24 years had death rates approximately twice as high as females of the same age. This excess was particularly large in non-Aboriginal Territorians, in whom the male rate was over three times higher than the female rate.

19.14 NT most common causes of death: five to 24 years 1979 to 1995

NT Aboriginal		NT Non-Aboriginal	
Cause	%	Cause	%
Injury	53.2	Injury	78.8
Circulatory	11.6	Ill-defined	6.2
Ill-defined	5.8	Circulatory	2.7

Note: Proportion of all deaths in this age group

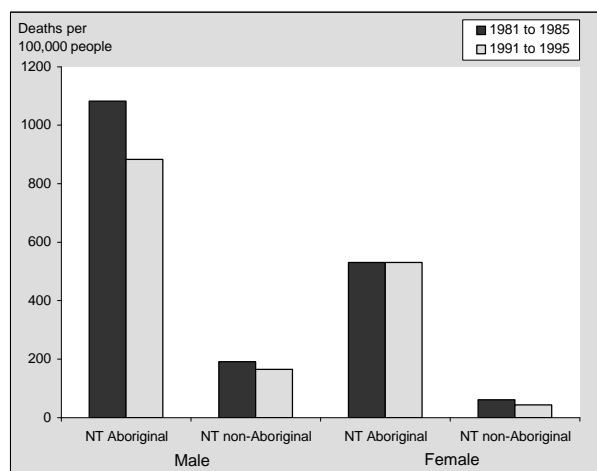
Source: Dempsey & Condon 1999

Young people aged from five to 24 years are almost all fit and healthy, and death is least common in this age group. From 1979 to 1995, for Territorians in this age group (table 19.14):

- almost all non-Aboriginal deaths resulted from injury
- over half of Aboriginal deaths resulted from injury, but illnesses such as circulatory diseases also caused a significant proportion of deaths

Young adults

19.15 NT death rates: 25 to 44 years 1981 to 1995



Note: Death rates for all causes per 100,000 people in this age group
Source: Dempsey & Condon 1999

19.16 Death rates: 25 to 44 years 1981 to 1995

	NT Aboriginal	NT Non-Aboriginal	Australia
Male			
1981 to 1985	1,081.0	192.2	155.6
1991 to 1995	881.5	164.1	152.1
Female			
1981 to 1985	528.5	62.3	77.8
1991 to 1995	528.5	43.4	70.0

Note: Death rates for all causes per 100,000 people in this age group
Source: Dempsey & Condon 1999

There was only a slight fall in the Australian death rates of males and females aged 25 to 44 years between the early 1980s and early 1990s. In this period, among NT Aboriginal people in this age group, the death rate of females did not fall at all while that of males decreased by 18%. Nevertheless, by the early 1990s, the NT Aboriginal male death rate remained over five times higher than the Australian male rate, and the NT Aboriginal female rate was over seven times higher than the Australian female rate (graph 19.15 and table 19.16).

In this age group, the NT non-Aboriginal male death rate was higher than the Australian male rate in the early 1980s but fell by 15% to be similar in the early 1990s. The death rate of NT non-Aboriginal females was considerably lower than that of Australian females and fell by 30% between the early 1980s and early 1990s. The death rate of males was approximately double that of females for Territorians, both Aboriginal and non-Aboriginal, and for Australians generally.

19.17 NT most common causes of death: 25 to 44 years 1979 to 1995

NT Aboriginal		NT Non-Aboriginal	
Cause	%	Cause	%
Injury	29.9	Injury	60.1
Circulatory	24.5	Circulatory	10.9
Respiratory	12.3	Cancer	10.1

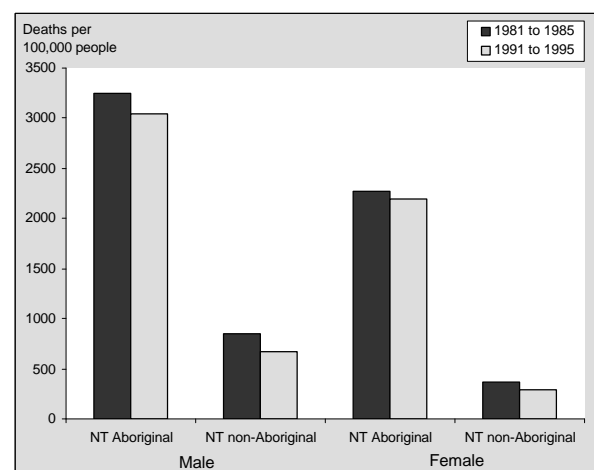
Note: Proportion of all deaths in this age group

Source: Dempsey & Condon 1999

As in those aged five to 24 years, injury caused the majority (almost two-thirds) of deaths in NT non-Aboriginals aged 25 to 44 years between 1979 and 1995. Injury was also the most common cause of death among young adult Aboriginal people, but chronic diseases such as circulatory and respiratory disease also caused a large proportion of deaths (table 19.17).

Middle-aged people

19.18 NT death rates: 45 to 64 years 1981 to 1995



Note: Death rates for all causes per 100,000 people in this age group
Source: Dempsey & Condon 1999

19.19 Death rates: 45 to 64 years 1981 to 1995

	NT Aboriginal	NT Non-Aboriginal	Australia
Male			
1981 to 1985	3,243.6	848.0	1,021.1
1991 to 1995	3,042.2	670.0	686.0
Female			
1981 to 1985	2,272.1	365.1	539.3
1991 to 1995	2,197.8	286.2	388.8

Note: Death rates for all causes per 100,000 people in this age group
Source: Dempsey & Condon 1999

Australian death rates of males and females aged 45 to 64 years fell by approximately 30% between the early 1980s and early 1990s. Death rates of

non-Aboriginal Territorians, both male and female, fell by approximately 20% over this period. From 1991 to 1995, the NT non-Aboriginal male death rate was similar to that of Australian males while the NT non-Aboriginal female death rate was considerably lower than that of Australian females (graph 19.18 and table 19.19).

For NT Aboriginal males and females aged 45 to 64 years, death rates were many times higher than Australian rates, and fell only slightly between the early 1980s and the early 1990s. In the period 1991 to 1995, the NT Aboriginal male rate was over four times higher, and the female rate over five times higher, than the comparable Australian rate. In this age group, the disadvantage of Aboriginal Territorians had actually worsened considerably since the early 1980s, when NT Aboriginal male death rates were only three times higher than those of Australian males and NT Aboriginal female death rates were four times higher than those of Australian females.

19.20 NT most common causes of death: 45 to 64 years 1979 to 1995

NT Aboriginal		NT Non-Aboriginal	
Cause	%	Cause	%
Circulatory	29.2	Cancer	33.6
Respiratory	19.8	Circulatory	28.3
Cancer	16.8	Injury	12.8

Note: Proportion of all deaths in this age group

Source: Dempsey & Condon 1999

Respiratory disease was a more common cause of death, and cancer accounted for a considerably smaller proportion of deaths, in Aboriginal Territorians aged 45 to 64 years than in their non-Aboriginal counterparts between 1979 and 1995 (table 19.20).

Older people

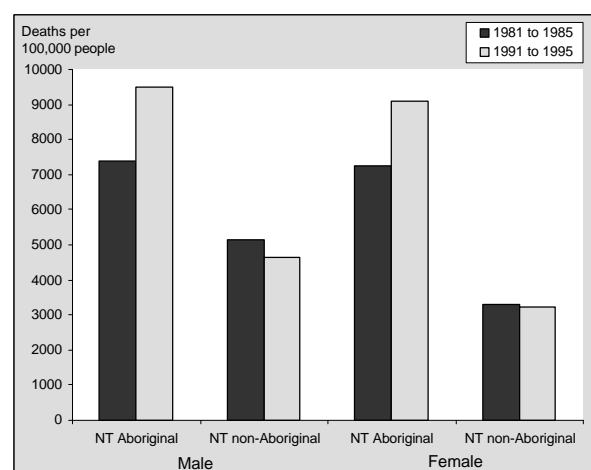
19.21 Death rates: 65 years and over 1981 to 1995

	NT Aboriginal	NT Non-Aboriginal	Australia
Male			
1981 to 1985	7,401.8	5,134.3	6,069.3
1991 to 1995	9,509.6	4,632.3	5,238.2
Female			
1981 to 1985	7,263.6	3,295.6	4,394.3
1991 to 1995	9,100.4	3,218.4	4,042.4

Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

19.22 NT death rates: 65 years and over 1981 to 1995



Note: Death rates for all causes per 100,000 people in this age group

Source: Dempsey & Condon 1999

Between the early 1980s and the early 1990s, the death rate of Australians aged 65 and over declined by 14% for males and by 8% for females. A somewhat smaller fall occurred for non-Aboriginal Territorians, but the death rate of older Aboriginal Territorians increased by over 25% between the early 1980s and the early 1990s (graph 19.22 and table 19.21).

In the period 1991 to 1995, the death rates of older Aboriginal Territorians, both male and female, were approximately twice as high as the Australian rates. Although the excess in NT Aboriginal death rates (compared with Australian rates) was lower in older

19.23 NT most common causes of death: 65 years and over 1979 to 1995

NT Aboriginal		NT Non-Aboriginal	
Cause	%	Cause	%
Circulatory	32.6	Circulatory	40.9
Respiratory	25.9	Cancer	26.8
Cancer	12.0	Respiratory	13.7

Note: Proportion of all deaths in this age group

Source: Dempsey & Condon 1999

people than in younger people, Aboriginal death rates in this age group were increasing while they were falling in all other age groups.

As in those aged 45 to 64 years, respiratory disease was a more common cause of death, and cancer accounted for a considerably smaller proportion of deaths, in Aboriginal Territorians aged 65 and over, than in non-Aboriginal Territorians (table 19.23).

References

ABS 1997a, *Australian Demographic Statistics December Quarter 1997*, cat no 3101.0, Canberra.

ABS 1997b, *Australian Demographic Trends 1997*, cat no 3102.0, Canberra.

Dempsey KE & Condon JR 1999, *Mortality in the Northern Territory, 1979 to 1997*, THS, Darwin.

Thomson NJ 1991, 'Recent trends in Aboriginal Mortality', *Medical Journal of Australia*, vol 154, no 4, pp 235–9.

Appendices

Appendix A: Mental health

Inpatient admission data has been converted from 27 ICD-9-CM codes into the following 12 mental illness categories.

A.1 Collapsed codes of ICD-9 290–316

Mental Health Disorder	ICD-9 codes
Dementia	290
Alcohol & drug psychoses	291–292
Schizophrenia	295
Affective disorders	296
Paranoid states	297
Other psychoses	298–299
Neuroses	300
Personality disorders	301
Alcohol & drug dependence	303–305
Adjustment reactions	308–309
Other non-psychoses	293–294, 302, 306–307, 310–311, 312–314, 316

Notes: 'Dementia' is an often age-related illness characterised by impaired memory, judgement and intellect
 'Psychoses' are characterised by distorted thinking and behaviour
 'Schizophrenia' is form of psychosis characterised by episodes of abnormal perception and beliefs
 'Affective disorders' are mental illnesses characterised by abnormalities of mood
 'Other psychoses' include transient organic psychoses and chronic organic psychoses
 'Paranoid states' are mental illnesses characterised by delusions, often of persecution
 'Neuroses' include anxiety-related illnesses such as phobias and obsessive-compulsive disorders
 'Personality disorders' are mental illnesses characterised by a pervasive pattern of maladaptive behaviour
 'Adjustment reactions' are brief psychiatric disorders resulting from stress
 'Other non-psychoses' include sexual deviations and disorders, physiological malfunctions arising from mental factors, special symptoms or syndromes not elsewhere classified, specific non-psychotic mental disorders due to organic brain damage, disturbance of conduct not elsewhere classified, disturbance of emotions specific to childhood and adolescence, hyperkinetic syndrome of childhood, and psychic factors associated with diseases not classified elsewhere

Appendix B: Communicable diseases

Schedule 2 non-urgent notifiable diseases

AIDS¹; Amoebiasis²; Arbovirus infections—dengue virus infection if acquired outside NT¹, Barmah Forest

virus infection², dengue virus infection², Ross River virus infection², not otherwise specified²; Atypical mycobacteria²; Brucellosis²; Campylobacteriosis²; Chlamydia infection—genital, conjunctivitis²; Congenital rubella syndrome¹; Congenital syphilis¹; Cryptosporidiosis²; Donovanosis (granuloma inguinale)^{1 2}; Gonococcal infection—genital, neonatal²; Hepatitis B²; Hepatitis C²; Hepatitis D²; Hepatitis not otherwise specified²; HIV²; HTLV1—all forms², adult T cell leukaemia/lymphoma¹, tropical spastic paraparesis¹; Hydatid infection²; Influenza²; Leprosy^{1 2}; Leptospirosis²; Listeriosis²; Lymphogranuloma venereum^{1 2}; Melioidosis²; Mumps^{1 2}; Ornithosis²; Pneumococcal disease (invasive)²; Q Fever²; Rheumatic fever¹; Rotavirus infection²; Rubella^{1 2}; Salmonellosis²; Shiga-like toxin (verocytotoxin) producing *escherichia coli* infection²; Shigellosis²; Syphilis^{1 2}; Tetanus^{1 2}; Trichomoniasis²; Typhus (all forms)^{1 2}; Vibrio food poisoning²; Yersiniosis²;

Schedule 3 urgent notifiable diseases

Acute post-streptococcal glomerulonephritis¹; Adverse vaccine reactions¹; Anthrax²; Arbovirus infections—Australian encephalitis (MVE, kunjin)^{1 2}, dengue virus infection (if acquired in the NT)¹, Japanese encephalitis²; Botulism (food borne)^{1 2}; Chancroid^{1 2}; Cholera²; Diphtheria^{1 2}; Food or water borne disease in two or more related cases¹; Gastroenteritis involving one or more related cases in an institution or in a food handler¹; Gonococcal infection (conjunctivitis)¹; Gonococcal infection—conjunctivitis (epidemic)²; Haemolytic uraemic syndrome* ¹; *Haemophilus influenzae* type b (invasive)^{1 2}; Hepatitis (acute viral)¹; Hepatitis A²; Hepatitis E²; Legionellosis²; Lyssavirus—Australian bat lyssavirus, rabies²; Malaria^{1 2}; Measles^{1 2}; Meningococcal infection^{1 2}; Pertussis^{1 2}; Plague^{1 2}; Poliomyelitis^{1 2}; Smallpox²; Thrombotic thrombocytopenic purpura* ¹; Tuberculosis^{1 2}; Typhoid & paratyphoid²; Viral haemorrhagic fever—all forms¹, ebola virus disease², lassa fever², marburg virus disease², not otherwise specified²; Yellow fever^{1 2}

Notes: ¹ Notifiable by doctors
² Notifiable by laboratories
 * Associated with verocytotoxic *E coli* infections.

Appendix C: Injury and violence

A.2 NT causes of injury separations 1993 to 1997

Injury		0–4 yrs	5–14 yrs	15–24 yrs	25–49 yrs	50+ yrs
Other unintentional	Cases	450	825	1133	2530	563
	Rate	515.4	532.2	786.3	668.2	492.9
Intentional—inflicted by another	Cases	48	70	1072	3130	303
	Rate	55.0	45.2	743.9	826.7	265.3
Iatrogenic	Cases	189	158	311	1494	1206
	Rate	216.5	101.9	215.8	394.6	1,055.9
Transportation	Cases	93	416	822	1264	245
	Rate	106.5	268.3	570.4	333.8	214.5
Falls	Cases	285	1004	249	664	459
	Rate	326.4	647.6	172.8	175.4	175.4
Intentional—self-inflicted	Cases	3	8	212	474	47
	Rate	3.4	5.2	147.1	125.2	41.1
Poisoning—pharmaceuticals	Cases	125	25	100	221	34
	Rate	143.2	16.1	69.4	58.4	29.8
Fire, burns, scalds	Cases	58	44	30	131	62
	Rate	66.4	28.4	20.8	34.6	54.3
Poisoning—other substances	Cases	64	23	66	170	30
	Rate	73.3	14.8	45.8	44.9	26.3
Undetermined intent	Cases	4	10	31	72	9
	Rate	4.6	6.5	21.5	19.0	7.9
Submersion	Cases	33	5	3	7	1
	Rate	37.8	3.2	2.1	1.8	0.9
All causes	Cases	1,537	2,891	4,251	11,022	3,508
	Rate	1,760.3	1,864.8	2,950.1	2,911.0	3,071.3

Notes: Numbers and rates of injury hospital separations (admissions) by cause and age group
 Shaded cells represent age-specific hospital separation rates per 100,000 people
 'Other unintentional' includes injuries caused by natural disasters, excessive heat or cold, suffocation, animal bites, explosion, sports injuries, being caught or crushed, electricity, radiation, cutting and corrosive substances
 'Iatrogenic' includes medical complications and medical misadventure
 'Submersion' means near-drowning
 'Poisoning—other substances' is accidental poisoning by non-medicinal solids, liquids, gases and vapours

Data: Epidemiology Branch, THS

Appendix D: Statistical measures

Prevalence

The prevalence of a particular disease or condition is simply the proportion of people who have the disease at a particular time. It is calculated as the number of people with the disease divided by the total number of people. It is usually expressed as a percentage, the number of people with the disease in every hundred people.

Incidence rate

An incidence rate is a measure of the occurrence of events in a population over time. Many health events are measured as a rate, including death, hospital admission, and being diagnosed with a particular disease. The incidence rate is usually expressed as the number of events per 100,000 (or per 1,000) people per year.

Incidence is different to prevalence. Incidence measures new occurrences of an event in a population over time, while prevalence measures the proportion of a population who have a specific condition at a particular time. Using cancer as an example, the cancer incidence rate measures the number of new cases of cancer per 100,000 people per year, while the cancer prevalence measures the proportion of people who have cancer at any one time.

Age-specific incidence rate

The age-specific incidence rate is the rate within people of a particular age group. It is calculated as the number of events in people in a particular age group during a period of time divided by the total number of people in that age group who could have had the event happen to them during that period of time. It is calculated in the same way as other incidence rates, but is restricted to only people in a certain age group.

For example, for deaths, the age-specific death rate for the 45–64 year age group for 1996 is the number of people aged 45–64 who died during 1996 divided by the total number of people aged between 45 and 64 during 1996. Like other rates, it is expressed as the number of deaths per 100,000 people (aged 45–64) per year.

Age-adjusted rate (also called age-standardised rate)

Many health events (such as death or the occurrence of disease) are much more common in older people than younger people. Compared to the rest of Australia, a high proportion of the NT population are young people, and a low proportion older people. In a population with a low proportion of older people we would see fewer cases of many diseases, particularly chronic disease like heart disease and diabetes, and cancers, and deaths, than we would see in a population with a high proportion of older people. If young people in the NT were just as healthy as young people in Australia overall, and older people in the NT were just as healthy as older people in Australia overall, disease incidence rates would be less in the NT because the NT population is younger, despite the fact that the NT population is no more or less healthy than the rest of Australia.

When comparing NT disease incidence rates with Australian rates it is important to take the younger age structure of the NT population into account. This is done by using 'age-adjusted' incidence rates. Age-adjustment is a statistical procedure which 'adjusts' the rate in each population to allow for the fact that the populations have different age structures, and so to remove the effect of the different proportions of older people in each population. The 'age-adjusted rates' of different populations can then be compared. Any difference in the age-adjusted rates between the two populations is then due to factors such as a real difference in health status between the two populations, not to the different age structure of the two populations.

Where incidence or death rates have been age standardised in this publication, this has usually been done by the direct standardisation method, which involves calculating the rate which would have occurred in a standard population if the age-specific rates in the various study populations had occurred in that standard population. Unless otherwise specified, the standard population used throughout this report is the Estimated Resident Population of Australia at 30 June 1991, which has been adopted as the standard population for direct age standardisation by the Australian Bureau of Statistics and the Australian Institute of Health and Welfare.

Full details of the statistical process of age adjustment can be found in epidemiological textbooks such as 'Epidemiology in Medicine' (Hennekens & Buring 1987).

Years of potential life lost

Years of potential of life lost is a statistical summary of the number and age of people who die. This measure indicates the effect of death at a young age. The 'potential years of life lost' for each person who dies is 65 minus the age of the person at the time of their death. This is a measure of the number of years the person 'should have lived' had they not been affected by the disease or injury that caused them to die 'early'. Age 65 is an arbitrary age used for most calculations of years of potential life lost. It is calculated by taking the number of years between the age of each person's death and age 65 (eg, a person who dies at age 45 has 'lost' 20 years before age 65, a person who dies after age 65 has lost 0 years before age 65), and adding these up for all deaths. Years of potential life lost is a useful measure to emphasise the effect of diseases or conditions which cause death at an early age such as injury and violence.

Random fluctuation in a small population

Because the number of people in the NT is small, the number of deaths or new occurrences of many diseases is very low, and may fluctuate considerably from year to year for no reason other than random chance. In year A there may be 10 deaths from a certain disease, in the year B, 20, and in year C only 5. This does not mean that this disease was twice as big a health problem in B as in year A, but then only a quarter as big a problem the following year. In small populations, changes such as this usually occur because of random fluctuations in the number of events from year to year rather than because of any real change in the seriousness of the disease.

To reduce the effect of these random fluctuations in the small NT population, incidence rates are often calculated as the average annual incidence rate for several years combined. This is calculated by taking the total number of events in those years and dividing by the sum of the populations for each of those years.

This will hide any major changes within the years grouped together, but is more reliable when comparing groups within the NT (such as Aboriginal to non-Aboriginal, male to female, or one district to another), or when comparing the NT to the rest of Australia.

Population data

Unless otherwise stated, the population data used for the NT and Australia was the Estimated Resident Population at 30 June each year as published by the Australian Bureau of Statistics (ABS). For the Indigenous population of the NT and Australia, the Experimental Estimates of the Indigenous Population published by the ABS were used. These are the official population data for Australian Indigenous people—the term 'Experimental' is used by the ABS because these estimates are not as accurate as the total Estimated Resident Population. This lower accuracy is due to problems in counting Indigenous Australians during the five-yearly national Census and because of incomplete data on Indigenous births, deaths and interstate migration which are necessary to calculate population estimates between Census years.

The non-Indigenous population was calculated by subtracting the Indigenous estimate from the total Estimated Resident Population.

Detailed population data are not published by the ABS for districts within the NT. The Epidemiology Branch of Territory Health Services derived population estimates for NT Districts by apportioning the total NT population (within categories of age, sex and Indigenous status) to each district according to the proportion in each district as counted at the previous Census. Further information on this process may be obtained from the Director, Epidemiology Branch, THS.

References

- ABS 1998a, *Demography Northern Territory 1997*, cat no 3311.7, Canberra.
- ABS 1998b, *Experimental projections of the Aboriginal and Torres Strait Islander population*, cat no 3231.0, Canberra.
- Hennekens CH & Buring JE 1987, *Epidemiology in medicine*, Little, Brown and Company, Boston.

A.3 NT population 30 June 1997

Age group	NT Aboriginal			NT Non-Aboriginal			NT Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-4	3,649	3,355	7,004	5,588	5,399	10,987	9,237	8,754	17,991
5-9	3,641	3,267	6,908	5,177	4,785	9,962	8,818	8,052	16,870
10-14	3,135	2,983	6,118	4,710	4,284	8,994	7,845	7,267	15,112
15-19	2,767	2,712	5,479	4,507	3,861	8,368	7,274	6,573	13,847
20-24	2,766	2,827	5,593	6,557	5,575	12,132	9,323	8,402	17,725
25-29	2,526	2,516	5,042	7,671	6,944	14,615	10,197	9,460	19,657
30-34	2,002	2,076	4,078	7,148	6,343	13,491	9,150	8,419	17,569
35-39	1,530	1,702	3,232	7,114	6,021	13,135	8,644	7,723	16,367
40-44	1,310	1,430	2,740	6,184	5,366	11,550	7,494	6,796	14,290
45-49	909	1,034	1,943	5,743	4,679	10,422	6,652	5,713	12,365
50-54	768	838	1,606	4,604	3,297	7,901	5,372	4,135	9,507
55-59	507	574	1,081	3,070	1,923	4,993	3,577	2,497	6,074
60-64	394	522	916	1,628	1,089	2,717	2,022	1,611	3,633
65-69	249	324	573	1,225	787	2,012	1,474	1,111	2,585
70-74	153	202	355	738	572	1,310	891	774	1,665
75+	210	269	479	636	760	1,396	846	1,029	1,875
Total	26,516	26,631	53,147	72,300	61,685	133,985	98,816	88,316	187,132

Data: ABS 1998a, ABS 1998b

Abbreviations

AACR	Australasian Association of Cancer Registries
ABCI	Australian Bureau of Criminal Intelligence
ABS	Australian Bureau of Statistics
ACS	Australian Construction Services
ACT	Australian Capital Territory
ADCA	Alcohol and Other Drugs Council of Australia
ADF	Australian Drug Foundation
AGPS	Australian Government Printing Service
AIFS	Australian Institute of Family Studies
AIHW	Australian Institute of Health & Welfare
AMSANT	Aboriginal Medical Services Alliance Northern Territory
AMWAC	Australian Medical Workforce Advisory Committee
ANU	Australian National University
ATSIC	Aboriginal and Torres Strait Islander Commission
BAC	Blood alcohol concentration
CAAC	Central Australian Aboriginal Congress
CCIS	Community Care Information System
CDEP	Community Development Employment Project
CEIDA	Centre for Education and Information on Drugs and Alcohol
DEETYA	Department of Employment, Education, Training and Youth Affairs
H&FS	Commonwealth Department of Health and Family Services
HCINS	Housing and Community Infrastructure Survey
H&AC	Commonwealth Department of Health and Aged Care
HH&CS	Commonwealth Department of Health, Housing and Community Services
HS&H	Commonwealth Department of Human Services and Health
IAD	Institute for Aboriginal Development
ICD-9	Ninth revision of <i>The International Classification of Diseases</i>
IHANT	Indigenous Housing Authority of the NT
LANT	Legislative Assembly of the NT
NARU	North Australian Research Unit
NCEPH	National Centre for Epidemiology and Population Health
NDARC	Nation Drug and Alcohol Research Centre
NHMRC	National Health and Medical Research Council
NSW	New South Wales
NT	Northern Territory
NTAMS	Northern Territory Aerial Medical Service

NTCM	NT Department of the Chief Minister
NTCS&HITAB	NT Community Services and Health Industry Training Advisory Board Inc
NTGP	Government Printer of the NT
NTH	NT Department of Health
NTH&CS	NT Department of Health and Community Services
NTLH	NT Department of Lands and Housing
NTLHLG	NT Department of Lands, Housing and Local Government
NTLPE	NT Department of Lands, Planning and Environment
NTU	Northern Territory University
NZ	New Zealand
PAWA	NT Power and Water Authority
Qld	Queensland
RFDS	Royal Flying Doctor Service
SA	South Australia
Tas	Tasmania
THS	Territory Health Services
UK	United Kingdom
Vic	Victoria
WA	Western Australia
WHO	World Health Organization